THE

AMERICAN MEDICAL REVIEW AND JOURNAL.

VOL. III. AUGUST, 1826. No. II.

ART. I.—*The Anatomy of the Fœtal Brain, with a comparative exposition of its structure in Animals.* By FREDERIC TIEDEMANN, Prof. in the University of Heidelberg, Member of the Academy of Sciences of Munich and Berlin, &c. &c. Translated from the French of A. I. L. Jourdan. By WILLIAM BENNET, M. D. To which are added, some late Observations on the influence of the Sanguineous System over the development of the Nervous System in general. Edinburg, 1825.

"AFTER having described (says the author) the configuration of the brain and spinal marrow, during the different periods of gestation, I now proceed to trace, with the assistance of general data, the history of the formation of each of the parts, the union of which constitutes the encephalic mass."

From the observations contained in our preceding number, it is obvious that the brain of the fœtus is an organ comparatively simple, and that it is rendered complex by the addition of its several parts, at successive periods. It is an important object of our author's inquiry to determine whether in this it obeys the general law of formation of the brain in the animal kingdom, and for this purpose he compares, in the following pages, the fœtal brain of different periods with the same organ in different grades of animals. It is obvious that im-

portant results in relation to the functions of the several parts of the brain, are connected with this inquiry.

It will be recollected that at the end of the first month the spinal marrow is merely a membranous canal, containing a fluid which at the end of the second month becomes like the white of an egg, and the transparency of which gradually diminishes. Its walls are formed by the dura mater, not yet fibrous, and by the vascular pia mater which dips into the longitudinal groove, and the canal of the organ. Fibres were first seen about the fourth month. The connexion of the canal of the s. m. with the fourth ventricle, will be recollected, as also the comparative capacity of the canal at different periods.

The author observes, that the canal of the spinal marrow, which thus exists only in the fœtal state of the human species, is always present during the entire life of the animal, in fishes, reptiles and birds. The canal also exists in the spinal marrow of the fœtus of mammiferous animals, as also in the young animals of this class.

The author observes, also, that the same canal has been found in the human adult, but attributes its existence to a retardation in the development of the organ.

Our author is of opinion that the anatomy of the fœtus is by no means favourable to the hypothesis of Gall, who supposes that the spinal marrow of man and inferior animals is composed of ganglia or enlargements of gray substance distinct, but adherent one to the other, and corresponding in number to the nerves which it furnishes. On early examination nothing similar to these enlargements or ganglia can be found. It is true, however, that the greatest number of nerves emanate from where the cortical substance is most abundant, but this latter substance is of secondary formation.

Although our author does not admit that the nerves are generated and supported by this cortical substance, yet he admits that the latter is subservient and necessary to their vigorous action by virtue of the arterial blood which it conveys,

and hence that there is an intimate relation between the volume of the spinal nerves and the enlargement of the spinal marrow.

In many other respects the spinal marrow of the fœtus resembles that of the lower animals. During the first months the former has no caudiform expansion, but fills the whole length of the spinal column, until the end of the fourth month. The spinal marrow extends through the whole length of the vertebral canal in reptiles and birds, and forms neither tubercles nor caudiform expansion, while the nerves which emanate from it come out directly by the foramina, pierced in the sides of the vertebral column. The spinal marrow of mammiferous animals descends much lower down in the canal than that of the human adult.

It is remarkable that as the spinal marrow in animals is larger in proportion to the brain than in man, so also is the spinal marrow of the fœtus larger than that of the adult, as the embryo is younger. In the fœtus, the pons varolii does not appear till the fourth month. Fishes, reptiles and birds, are, during life, destitute of this eminence.

In the fœtus the two pyramidal fasciculi, situated on either side of the anterior longitudinal groove, form, until the third month, a broad and plane surface.

The corpora olivaria are wanting in reptiles, fishes and birds, nor do they appear in the fœtus till the end of the sixth month.

The author here considers the question, whether the spinal marrow be a production of the brain, or the brain be produced by the superior part of the spinal marrow. The facts advanced by our author in the preceding pages, in relation to the successive development of the several parts of the nervous system, leave little room to doubt the truth of the latter and the correctness of Gall in this particular, although Tiedemann allows him only the credit of having revived an old opinion and of successfully controverting a prevailing error.

Arguments supporting the same opinion are drawn from

comparative anatomy, for we find the brain acquiring a greater volume and development according as we ascend the scale from fishes to mammiferous animals, a progress absolutely similar to what it follows, when formed in the head of the human fœtus.

The author next compares the cerebellum of the fœtus with the same organ in the lower animals. On recurring to the preceding pages, it will be seen that the cerebellum proceeds from the two restiform fasciculi. These are first perceived at the end of the second month, and are obvious on the third. The ulterior development and formation of the cerebellum are owing to new cerebral substance secreted by the vessels which the pia mater sends into its interior, and which surrounds it on all sides. The permanent development of the cerebellum in osseous fishes, in many of the cartilaginous, and in the greater part of reptiles, corresponds to that of the fœtus of the third month.

In many varieties of these animals the organ is composed, as in the fœtus, of fasciculi, rising from the spinal marrow and uniting over the fourth ventricle. The pons varolii and the valve of Tarin are also wanting, and the organ is not susceptible of a division into hemispheres and a vermiform process. In birds the cerebellum is more complicated, for from the point where the two fasciculi unite over the fourth ventricle, the medullary substance divides into many branches, which are generally subdivided into two stems or leaflets.

The cerebellum of mammiferous animals presents a more perfect development than that of birds, reptiles, or fishes. Indeed, as we ascend the scale of being the same gradation of organization appears as in different periods of fœtal existence. "Reil," says our author, "has made a very just remark, that the number of stems in the cerebellum and of their divisions or subdivisions increases in proportion to the progress of animal organization towards complete perfection." We may add to these different particulars the observations of Malacarne on the intimate relation between the number of

leaflets of the cerebellum and the energy or extent of the intellectual faculties of the individual in the human species. This physician has found them less numerous in idiots and fatuous persons than in many who were distinguished by the force and brilliancy of their minds.

The volume of the two ciliary bodies correspond exactly in mammiferous animals to the bulk of the lateral parts of the cerebellum. They are very small in those animals where the hemispheres are but little developed, and they augment in the same proportion as these latter become more considerable; in the human fœtus also they undergo the same progressive formation.

The pons varolii exists in all mammiferous animals. The volume and thickness of this protuberance, examined successively in the different species, are in a direct proportion to the development of the hemispheres and the ciliary bodies. In the fœtus, as in reptiles, &c. the pons is absent, till the fourth month; afterwards it gradually augments according as the ciliary bodies increase, as in the mammalia.

In the fœtus the fourth ventricle is merely a continuation and enlargement of the canal of the spinal marrow. The pia mater introduced into this cavity forms a choroid plexus, which lines it and directs the blood to the inferior surface of the cerebellum. The gray bands of Wenzell, which give origin to the auditory nerve, appear on the fourth or fifth month.

The fourth ventricle exists always in fishes, reptiles, birds and mammiferous animals. In fishes it always communicates with the canal of the medulla, as in the fœtus. It is also continuous with the third ventricle in all these animals. In the mammiferous animals and birds the gray bands also were seen.

The author next notices comparatively the tubercula quadrigemina. It will be recollected, that in the second month of the fœtus these bodies consisted of merely two plates, inclining upwards and inwards. They are not united till the fourth month, when they form a bridge over the aqueduct of

Sylvius. At the end of the fourth month the hemispheres of the cerebrum begin to extend over them. We can discern, at the same time, the fibres which proceed from the spinal marrow and come from the olivary fasciculi. On the fifth month the tubercula are almost entirely concealed by the hemispheres of the brain, and on the sixth completely. Beneath the fibres which come from the olivary fasciculi, lie the superior crura cerebelli, of a fibrous texture. The nates and testes are seen on the seventh. The passage between the tubercula is almost obliterated.

The tubercula quadrigemina exist in the brain of all mammiferous animals, and are of the same structure as in man. In them, also, as was observed in the fœtus, the optic nerves arise from the tubercula. In many animals the tubercula are entirely covered by the cerebrum, but in others only partially. The volume of the tubercula is more considerable in proportion to that of the brain, as the latter possesses a more simple structure. The same is true of the brain of the fœtus. In birds the tubercula, which have been mistaken for the thalami nervorum opticorum, exist in the form of large, smooth, oval eminences, separated above by a longitudinal depression.

In all the animals of the class of reptiles dissected by the author, there is found in front of the cerebellum, as in birds, two rounded protuberances, oval and smooth, which have been called the optic chambers because they give origin to the optic nerves. These, in the opinion of our author, are the tubercula, and this he infers from the fact that he could discern fibres rising from the lateral parts of the cords, formed by the prolongation of the spinal marrow forwards, and spreading into the hollow walls of the eminences in question.

Many writers have taught that fishes are destitute of these tubercles. In front of the cerebellum are two smooth protuberances, round or oval, varying according to the species, and parted by a longitudinal depression. These, by some have been mistaken for the hemispheres, and by others for the

thalami; a few have thought them to be the tubercula, and this opinion our author adopts. They arise from the lateral parts of the cords, which are continued from the spinal marrow forwards and downwards, and expanding into a sort of membrane, are reflected inwards to give origin to two cavities which communicate with the anterior prolongation of the fourth ventricle; their borders, reflected inwards as in reptiles, are in opposition without uniting.

Our author next compares the optic chambers. These in the fœtus it will be recollected, are seen on the second month immediately in front of the tubercula, completely exposed, being mere enlargements of the peduncles of the brain. At the end of the third month the membranous hemisphere are extended over them. The reader will recollect what has been said with regard to their progressive development, and the passage through them of the fibres of the spinal marrow to the peduncles of the cerebrum, and finally to the periphery of the hemispheres. The pedicles of the pineal gland and some of the fibres of the nervi optici arise from them. Lastly, from the optic chamber arises a small cord which descends into the mammillary eminences, and reflected in their interior from below upwards, forms the commencement of the anterior pillar of the fornix.

It will be recollected that the pineal gland was not discerned in the fœtus till the fourth month. Fishes are destitute of this organ; reptiles, however, possess it, situated immediately behind the hemispheres of the brain, where it appears in the form of a small, round, soft body. It is also found in birds, situated behind the hemispheres of the brain immediately under the pia mater. Its pedicles proceed from the surface and internal border of the enlargements of the crura cerebri. The author never discovered any concretions either in the pineal gland of the fœtus nor that of reptiles nor fishes.

The gland is found in mammiferous animals, varying in figure, size and structure. In all, its medullary pedicles arise

from the superior surface of the optic chambers, and even a little from the nates; they are united together by a mass of reddish gray substance which constitutes the gland itself, and which in the hind and sheep is hollow. Gall regards this gland as a ganglion giving origin to nerves; our author, however, rather considers it to be a commissure of the two optic chambers, increased by a deposition of gray vascular substance.

The development of the corpora striata in the fœtus has been particularly described. The rudiments of them are first seen on the second month, and their development is not complete till the time of birth. These bodies do not properly exist in fishes; they are found, however, in reptiles. They exist in the form of oblong, smooth protuberances, partly covered by the choroid plexus. They lie anterior to and on the side of the enlargements of the cerebral peduncles. They are composed of an unfibrous substance of a reddish white colour, into which pass from above downwards, the blood-vessels coming from the choroid plexus. This substance rests on the fibres of the crus cerebri at their exit from the enlargement, that is to say, at the point where they turn outwards to constitute the thin round membranous wall of the hemisphere. Protuberances analogous to the corpora striata are very prominent in birds, constituting the greatest part of the hemispheres of the brain. They also exist in the brain of mammiferous animals. In many animals they form the greater part of the hemispheres of the brain, and in others they are very small. In reptiles, birds and mammiferous animals, the crura cerebri, after having quitted the optic chambers, pass into the corpora striata, where their mass is considerably increased by a mixture of gray substance.

It will be recollected that the anterior commissure is not perceived in the fœtus till the third month, consisting of a cord of medullary fibres closely connected together, and increased by the pia mater. This cord is formed of fibres of the crura cerebri, which diverge from the corpora striata and

are reflected from the middle lobes of the brain. It is to be regarded as the commissure of the corpora striata.

Our author combats the opinion of Gall that this cord is formed of converging fibres which arise from the cortical periphery, for he says that the cord is ascertained to exist before the hemispheres are at all organized.

In fishes the two protuberances from which the olfactory nerves arise are united by a white and medullary commissure. It exists in all reptiles and birds. It is also met with in mammiferous animals. It is observed that such of the mammiferous animals as possess the olfactory nerves, well developed, have the anterior commissure uniting the enlargements of these nerves.

The author next compares the anterior parts of the hemispheres of the brain. In the fœtus the rudiment of the hemispheres is seen in the second month, but their complete development occupies a long time, and is not completed till near the termination of fœtal existence. It is from their comparative deficiency in the early months that the parts which they subsequently cover are so conspicuous, as the commissures, the thalmi, the tubercula, &c. For a long time the hemispheres are mere sacs without convolutions, and filled with a large choroid plexus.

The author observes that precisely the same manner of formation occurs in the brain of animals, except that they are arrested in the different species, in different degrees of development, which those of the fœtus pass through in their successive evolution.

In many fishes are found, anterior to the protuberances from whence the optic nerves arise, and which correspond consequently to the tubercula quadrigemina, two full, massive eminences which give origin to the olfactory nerves. Haller termed them the superior tubercles of the olfactory nerves. They are in general smooth, sometimes covered with slight depressions and prominences, resembling small convolutions.

The volume of these protuberances varies according to the species.

The hemispheres exist in all reptiles examined by the author. They have been improperly denominated the ganglia of the olfactory nerve. They are voluminous, smooth masses, situated anterior to the bodies which are analogous to the tubercula. Each hemisphere represents a membranous sac. The thin medullary membrane rising from the anterior and lateral parts of the corpora striata is reflected backwards and inwards, and thus constitutes the wall of the ventricle. In this state the hemispheres of the brain of reptiles resemble evidently those of the fœtus of the third month, which present the same inflection, and the same extent posteriorly, covering the corpora striata and the optic chambers; leaving, however, the tubercula quadrigemina exposed, a peculiarity also observed in reptiles.

The hemispheres of the brain of birds are much more voluminous, more elevated, and more convex than those of reptiles. However, they do not cover the masses analogous to the tubercula quadrigemina, for we observe them still exposed as in the fœtus of the first periods of gestation.

The brain of mammiferous animals gradually approaches that of man in passing through various degrees of organization, which establish some resemblance between it and the brain of the fœtus; but the latter passes with rapidity through the degrees of its development. In some of the mammalia, however, the hemispheres have neither grooves nor convolutions, but are smooth and flattened; nor are the tubercula covered in all.

In the ape the cerebrum is large and convex, and covers even the cerebellum. As in the fœtus there are anterior, middle, and posterior lobes, and the convolutions are more obvious and numerous. With two or three exceptions however, animals of this class have no convolutions on the posterior lobes. "All these facts," says the author, "establish that

the hemispheres in the fœtus, as well as in animals, are developed laterally, and from before, backwards." Thus the brain of the adult is distinguished from that of animals by the volume and depth of the hemispheres, as also by the greater number of anfractuosities and convolutions.

The author next notices the crura cerebri and their expansion in the hemispheres.

In the fœtus of the third month, the continuity of the middle fasciculi of the spinal marrow with the crura cerebri, is perfectly evident, because the pons varolii is not yet in existence. The crura are seen to pass through the optic chambers, and the striata to the hemispheres, where they are converted into a membrane which is reflected backwards and inwards, and which constitutes the hemispheres of that period.

The progress of the crura cerebri to complete development has already been particularly described. It is not completed till the ninth month.

The expansion of the crura cerebri in the hemispheres is effected in the same manner in reptiles, birds, and mammiferous animals, as in the human fœtus. In reptiles and birds the fibres of the two cords proceed forwards, penetrate the protuberances analogous to the optic chambers of man, as also the corpora striata, and passing outwards and upwards, expand into the thin membranous plates, which represent the hemispheres of the brain, covering both the tubercles and the lateral ventricles. The crura cerebri of mammiferous animals are distributed precisely in the same manner.

Thus the hemispheres of the brain, which are primarily membranous, both during the first periods of uterine life in the fœtus, and in inferior animals, appear after the formation of the spinal marrow, crura cerebri, and their vascular enlargements, the optic chambers and corpora striata; thus clearly proving that they are the product of an expansion of the pyramidal fasciculi of the spinal marrow.

The observations of the author refute all that Gall has said on his supposed system of re-entrant fibres, and also his

opinion that the convolutions of the brain are the result of the folding of the original membranous hemispheres. The process which he has employed to demonstrate this folding, and by this means reduce the hemispheres to the condition of a membrane, always produces the rupture of the internal layers of fibres of the crura cerebri.

The author next speaks of the corpus callosum, the development of which in the progress of fœtal growth has already been particularly described.

It does not appear till the end of the third month, in the form of a small narrow commissure, and is formed from before, backwards. It results from the union of the fibres of the crura cerebri, after their expansion to form the hemispheres. The re-entrant fibres by which Gall explains its formation are merely imaginary. Reil is equally in error when he relates that this great commissure is composed of a distinct assemblage of fibres, for it is obvious that they are but a prolongation of those of the crura.

Fishes, reptiles, and birds, are destitute of the corpus callosum, as are very young fœtuses. It exists, however, in mammiferous animals. In many, the radiation of the medullary fibres in the hemispheres, and their inflection inwards to unite and form the corpus callosum, are exceedingly evident.

The author remarks that the brain of man is subject to an imperfect development of the corpus callosum, and is liable to be arrested in one of the degrees of evolution through which it passes in the successive series.

It will be recollected that the lateral ventricles were described as being formed by the membranous walls of the hemispheres. Their gradual development has been described. On the eighth and ninth months they resemble perfectly in their configuration those of the adult.

To the different temporary states of the ventricles in the human embryo correspond permanent ones in the different animals. They are not found at all in certain fishes, but are

present in others. In reptiles and birds they are very capacious, but have no cornua. They exist in the brain of mammiferous animals, and have both the anterior and descending cornua.

The lateral ventricles are therefore formed at a later period than the canal of the spinal marrow, and then, in the human fœtus, the third and fourth ventricles as also in animals.

The lateral ventricles are destined, as all those of the brain, and as the canal of the spinal marrow, to present to the pia mater a more extensive surface for the expansion of blood-vessels, and for furnishing a serous exhalation.

The corpora mammillaria, it will be recollected, do not appear till the end of the third month. They are not found in reptiles, but are seen in birds, and also in mammiferous animals.

The fornix and septum lucidum, are not discovered in the fœtal brain till the end of the third month. The fornix is gradually formed from below, upwards; the anterior pillars, arising from the fibrous fasciculi which proceed from the optic chambers, descend into the corpora mammillaria, and are there reflected upon themselves. The septum lucidum, is formed of medullary plates proceeding from the pillars of the fornix to the inferior surface of the corpus callosum. Neither of these organs exist in fishes, reptiles, or birds. In mammiferous animals, however, we always meet the fornix, septum lucidum and its ventricle. The fornix presents no difference in all these animals with regard to the manner of its formation; it is always a medullary fasciculus descending from the optic chambers into the mammillaria, and reflected there passes up behind the anterior commissure; Gall, therefore, is mistaken in regard to this organ also.

The cornu ammonis does not exist till the fourth month of the fœtus. The manner in which it is produced has been described. As it is one of the latest parts developed in the brain of the fœtus, we find it appearing very late in the series of animals, for it is only in the mammiferous class that we

commence to observe it. It is more developed in proportion to the mass of the brain in mammiferous animals than in man. It is formed by a fold of the hemispheres of the brain, proceeding inwards, and this fold is united to the posterior pillar of the fornix, constituting the corpus fimbriatum.

The unciform eminence or hippocampus minor, is formed of a fold of the membranous hemisphere. This portion of the brain exists in no animal, because they are destitute of the posterior lobes of the brain.

The pituitary gland exists in fishes, reptiles, birds, and mammiferous animals. In fishes it is very large. In reptiles, and birds, it represents a hollow pyramidal eminence. In the mammalia it is larger in proportion to the size of the brain than in man.

ART. II.—*An Inquiry into the Nature and Treatment of Diabetes, Calculus, and other Affections of the Urinary Organs, &c. &c.* By WILLIAM PROUT, M. D. F. R. S. With Notes and Additions. By S. COLHOUN, M. D. Member of the American Philosophical Society, &c. Philadelphia. By Towar and Hogan. 1826. 8vo. pp. 308.

IN order to exhibit more strikingly the natural condition of the urine, and the morbid changes to which it is liable, Dr. Prout, in the first place, enters into the consideration of the various principles which enter into the composition of this secretion, with a particular "reference to those entering into the composition of the blood from which it is formed." According to the most accurate observations on this point, it appears that these two fluids, in their healthy state, are composed of the following principles, which the author has thus contrasted in the annexed tabular view:

Blood contains,	*Healthy,*
Water.	Water.
Albumen, fibrin, red particles.	
Urea.	
Lithic acid.	
Lactic acid, and its accompanying animal matters.	Lactic acid, and its accompanying animal matters.
Sulphur. Phosphorus. Muriatic acid. Fluorine?	Sulphuric acid. Phosphoric acid. Muriatic acid. Fluoric acid?
Potash. Soda. Lime. Magnesia. Silex?	Potash. Soda. Ammonia. Lime. Magnesia. Silex?
	Mucus of the bladder.

The watery part of the urine may be so inordinately increased or diminished as to become in itself a source of disease. When the watery portion is excessive the urine is generally limpid and colourless,—is of a low specific gravity, and is voided in unusually copious quantities.

The *albumen, fibrin, and red particles* of the blood are never present in *healthy* urine. In some diseases, however, and particularly in some varieties of dropsy, not only serum, but even fibrin and the red particles of the blood pass through the kidneys unchanged, and manifest themselves in the urine. Albuminous urine becomes opaque and deposits flakes of this substance on being exposed to a temperature of about 105°. Our author thinks that the albumen is sometimes derived from the blood, and at others from imperfectly assimilated chyle. When the precipitate which is formed by exposing albuminous urine to heat, is of a firm character and resembles that formed by the serum of the blood, he thinks that it is derived from this fluid; when on the contrary it is "very delicate and fragile in its texture, and somewhat resembles curd, it may," he says, "be supposed to be of chylous origin." The most delicate test for albuminous matter is dilute acetic acid; the prussiate of potash also is an excellent test.

Urea is a substance peculiar to urine. In its separate and pure state it assumes the form of a four sided prism; and is both transparent and colourless. When placed on the tongue

it leaves a sensation of coldness like nitre; it is neither acid nor alkaline. It does not diliquiesce in dry air, but when exposed to a strong heat it melts and partly decomposes and partly sublimes. Its specific gravity is about 1.350.

The mode which our author uses for detecting an excess of urea, is to put a small portion of the urine into a watch-glass and adding to it slowly nearly an equal quantity of pure nitric acid, "in such a manner that the acid shall subside to the lower part of the glass, and allow the urine to float above it. If spontaneous crystallization takes place an excess of urea is indicated; and the degree of excess can be inferred, near enough for practical purposes, by the greater or less time which elapses before crystallization takes place, which time may vary from a few minutes to two or three hours." The author observes that he knows of no disease that is attended by a diminished portion of urea; but there is a variety of diabetes of which an *excess* of urea seems to be characteristic.

Lithic acid, is commonly supposed to exist in the urine in a free state, "and held in solution merely by its solubility in water." This opinion is improbable for the following reasons:

"*First.*—According to the analysis of Berzelius, 1000 parts of healthy urine contain in solution one part of lithic acid; but Dr. Henry states, that one part of lithic acid requires, 60°, at least 1720 parts of water to dissolve it. Now how are we to reconcile these two statements, on the supposition that lithic acid exists in the urine in a free state? Secondly, the addition of any acid to the urine, even the carbonic, as is well known, throws down the lithic acid. How is it possible to explain this fact, except on the supposition that the new acid combines with something retaining the lithic acid in solution, which, being set at liberty, is thus incapable of remaining any longer in solution, and is consequently precipitated in the solid form. Thirdly, There is no instance known in which lithic acid is secreted in a free state: birds, serpents, &c. always secrete it in combination with ammonia: in the gouty chalk-stone it is secreted in combi-

nation with soda. To suppose, therefore, that the human kidney secretes lithic acid in a free state, is to suppose an exception to a law which appears to be very general. Lastly, The lithate of ammonia often *does* exist in large proportions in human urine, as is proved by the fact that many of the amorphous sediments consist chiefly of that compound, as will be shown hereafter. On reflecting upon these circumstances, I was induced to make some experiments on the subject, the result of which has been such as to render it probable that the lithic acid in healthy urine exists in a state of combination with ammonia, and that in reality this fluid contains no uncombined acid at all.

"Thus with respect to the solubility of lithic acid in water, I find that this principle, when pure, requires about six times more water to dissolve it than has been stated by Dr. Henry, or at least 10,000 times its own weight at 60°; a fact which adds much to the improbability of the common opinion. On the contrary, the lithate of ammonia requires only about 480 times its weight at the same temperature; and if to the solution any acid be added, the lithate is immediately decomposed, and the acid precipitated in the solid state; just as happens to the urine when similarly treated. Further, the lithate of ammonia, when in solution, reddens litmus paper; and what is singular, and scarcely would have been expected, is likewise capable of existing in the same solution with a solution of the super-phosphate of ammonia, which, as is well known, has likewise the property of reddening litmus paper. Now, as the phosphate, or rather super-phosphate of ammonia exists in healthy urine, this fact, taken in conjunction with the others, enables us to account very satisfactorily for the two important points in question, namely, the property of reddening litmus paper possessed by that fluid, and also for the permanent state of solution in which the lithic acid is held in it; both of which appear inexplicable on the common opinion. Further, if we evaporate healthy urine slowly, as, for example, under the receiver of an air-pump, with sulphuric acid, the lithate of ammonia is deposited on the sides of the vessel in abundance, in the form of an amorphous sediment; whereas, if this acid existed in the urine in the free state, it should be deposited in a pure crystallized form. Lastly, the supposition that the lithic acid exists in the urine in

the state of lithate of ammonia, will enable us to throw considerable light on the phenomena presented by the urine in different diseases, as will be shown hereafter."

On the subject of the changes which lithic acid is capable of undergoing, the author makes the following observations:

"When nitric acid, diluted with about an equal bulk of water, is poured upon pure lithic acid, and a moderate heat is applied, an effervescence takes place, and the lithic acid is dissolved. If we concentrate this solution by a gentle evaporation, we obtain transparent colourless crystals, which have been found to constitute a peculiar acid, and have been hence named by M. Brugnatelli, who first described them, *erythric acid*. 2. If into a strong solution of these crystals in water, whilst boiling hot, we carefully drop pure ammonia, the solution acquires a beautiful purple colour, and crystals of *purpurate of ammonia* speedily begin to form and subside. 3. If these crystals are treated by means of potash and sulphuric acid, in a manner formerly described by me, pure *purpuric acid* is obtained in the form of a yellowish or cream-coloured powder. Such is a part of the series of changes which lithic acid is capable of undergoing, and apparently does undergo, in the human body in different diseases, either by the action of the kidneys, or the natural operation of the various principles existing in the urine upon one another, as we shall now attempt to explain.

"The amorphous, or uncrystallized sediments, usually denominated *pink* and *lateritious* sediments, and supposed by Proust to constitute a peculiar acid, which he named the *rosacic*, have been long known. These I find, by well known methods, to consist essentially of the *lithate of ammonia*, and sometimes of the *lithate of soda*. They owe their colour partly to the colouring matter of the urine, to be described hereafter, and partly (in some instances apparently, almost entirely) to the *purpurates of the same bases*. I acknowledge that it is difficult, or indeed almost impossible, to prove these latter points by direct experiment; but the following observations will, I think, place their truth beyond a doubt.

"When pure lithate of ammonia is diffused through fresh healthy urine, it attracts to itself a portion of the colouring matter of that fluid, and falls down in the state of a yellowish powder. But if the least quantity of a solution of an alkaline purpurate be added to the urine, such is the affinity of the lithate of ammonia for this colouring substance, that it immediately attracts the purpurate to itself, and assumes the form of a red or pink powder, more or less deep, and varying in tint according to the purpurate employed. From these observations it is evident that if ever the purpurates exist in the urine when amorphous sediments are precipitated from it, these sediments must necessarily become more or less tinged by them. To establish the point in question, therefore, we have now only to render it probable that the purpurates do exist in the urine under certain circumstances of disease.

"I have shown elsewhere, that the pink and lateritious sediments occasionally contain nitric acid in some peculiar state of combination. Now the purpuric acid, or rather the purpurate of ammonia, is only lithic acid modified by the action of the nitric acid. If, therefore, nitric acid and lithic acid exist in the urine together, it is exceedingly probable, or rather certain, that at the temperature of the human body, a portion of the lithic acid will be acted on by the nitric acid, and converted into *purpurate of ammonia*. These facts, then, especially when taken into account with the absolute identity of tint, are, I think, sufficient to convince every unprejudiced reader that the pink amorphous sediments owe their colour chiefly to the alkaline purpurates, though from the circumstance of their being merely as it were dyed with the purpurates, these cannot be separated, and thus actually be demonstrated to be present."

We pass over our author's observations on the remaining principles which enter into the composition of healthy and morbid urine, and proceed to an account of the first chapter, which treats of the "*diseases in which the presence of an albuminous principle is the characteristic symptom.*"

The albuminous matter which occurs in urine, says the author, is of two kinds; namely, *chylous*, and *serous*. When

it is of the former kind it sometimes exists in great abundance, the urine undergoing a kind of spontaneous coagulation; but more frequently it is small in quantity and held in solution. Urine loaded with chylous albuminous matter generally soon enters into decomposition; this is particularly the case with urine passed some hours after meals. "This affection," says the author, "exists in every possible degree from barely perceptible traces of an albuminous principle to perfect chyle."

The symptoms which generally attend an albuminous condition of the urine are: a frequent desire to pass water, the urine being for the most part voided in excessive quantities. No pain is experienced; but the patient generally complains of "certain indescribable sensations which render him conscious that all is not right." When the diuresis is very great, there are "an inordinate craving for food and other symptoms somewhat resembling diabetes."

The author describes an interesting case which presents an extreme instance of this affection, and of which the following is an abstract.

The patient was a married woman aged about thirty years. The disease came on gradually. Her appetite was unnaturally great, and she had other diabetic symptoms: her general health, however, was but little affected, "and almost the only inconvenience she experienced was a constant difficulty of passing water, owing to the coagula which formed in the bladder blocking up the urethra." Nov. 1818. Three specimens of the patient's urine, "one voided in the morning, another soon after breakfast, and a third in the evening, were examined, and exhibited the following appearances. The first specimen acquired a jelly-like consistence, of a pale amber colour. This coagulum, when subjected to a gentle pressure, parted with a large portion of serous fluid, and assumed the appearance of a red fleshy-like mass of a fibrous texture, which, upon examination, was found to have all the proper-

ties of the fibrin of the blood mixed with a few red particles of the same. The second specimen differed from the first only in some minor particulars." The serum of both these specimens contained small portions of urea. The third specimen, "voided in the evening after an early dinner," so closely resembled chyle in all respects, that it could hardly be distinguished from this fluid. "It consisted of a solid coagulum of a white colour, and assuming the shape of the vessel" like *blanc-mange*. The residue, after pressing out its serous portion, was like that of the other specimens, small in quantity, but whiter. The serous portion resembled milk, and on being permitted to stand at rest, after having been heated, a cream-like substance rose to the surface, which contained "a considerable portion of butryaceous principle." It did not coagulate on being exposed to heat, although it contained a large portion of albuminous matter, "chiefly, however, in that state in which it exists in the chyle," and which our author denominates *incipient* albumen. Our author found that the coagulum formed by the patient's urine, voided after twenty-four hours' fasting, was much smaller, and contained more red particles. The serous portion, too, was nearly transparent, "and possessed in a considerable degree the colour and other sensible properties of urine."

A chylous condition of the urine is most apt to occur in persons of an irritable and scrofulous habit, and attended with impaired digestive powers.

Slight degrees of this affection do not seem to affect the constitution materially. "In this condition of the urine," says the author, "we can hardly lay down any specific plan of treatment, which must, therefore, depend very much on the nature of the disease with which the affection happens to be complicated.

The author says but little in relation to the second or *serous* form of albuminous matter. He thinks it questionable, however, whether the existence of *serous* urine is as Dr. Blackall maintains, an indication of the existence of an inflammatory state of the system.

"In the first place," says Dr. Prout, "with respect to the existence of unaltered serum in the urine, it must be either of rare occurrence, or very difficult to discriminate; for, as before observed, by far the greater proportion of the cases of albuminous urine that have fallen under my own observation, has seemed to me to belong rather to the *chylous* variety than the *serous:* I admit, indeed, that in a few cases of dropsy the albuminous matter appeared to possess more of the *serous* character: but except in one or two instances, in which the lithate of ammonia also abounded in the urine in great quantity, I could not discover any thing else remarkable in these cases. In the cases, however, in which the lithate of ammonia abounded, the albuminous matter seemed not only to partake more decidedly of the serous character, but the strength of the pulse, and determination to the head, also sufficiently indicated the use of the lancet, which was employed freely with great advantage; one of these cases, however, after all, terminated in apoplexy, which proved fatal."

CHAP. II.—*Diseases in which an excess of Urea is the characteristic symptom.*

The quantity of urea in *healthy* urine is so small that nitric acid does not produce its crystallization unless the urine is previously concentrated by evaporation. In certain morbid states of this secretion, however, the proportion of urine is so great as to crystallize on the addition of nitric acid without any concentration. "This," says the author, "is always a mark of some derangement in the health, and occasionally appears to be characteristic of certain varieties of disease which have been probably frequently confounded with diabetes."

"Those diseases in which an excess of urea may be considered as in some degree characteristic, do not appear to have been hitherto distinguished, but have been probably confounded with other diseases, and particularly with that form of diabetes which has been sometimes denominated diabetes *insipidus*. These diseases, however, differ considerably from diabetes, as the following observations will show:

"The average specific gravity of the urine in these complaints

seems to be a little above 1.020, and occasionally to vary from 1.015 to 1.030. Most generally it is pale, but occasionally it is high coloured, and exhibits somewhat the appearance of porter, more or less diluted with water; and this variety in appearance not unfrequently takes place in the urine of the same person. When first voided, it reddens litmus paper. For the most part it is entirely free from sediment, except the mucous cloud of healthy urine; and the only remarkable property which it appears to possess is that of containing abundance of urea, so that on the addition of nitric acid, crystallization speedily takes place. From the quantity of urea present, it is very prone to decomposition, and soon becomes alkaline, especially in warm weather.

"There is almost constantly in these diseases, a frequent and urgent desire of passing water both by night and day. This desire is for the most part evidently excited by actual *diuresis*, or the increased quantity of urine; but frequently it cannot be ascribed to this cause, as the quantity voided at one time is often by no means considerable; though in almost every instance that has fallen under my observation, the total quantity voided during any given time has appeared to be greater than natural. The quantity appears also to be particularly liable to be increased by cold weather, and by all causes producing mental agitation. There is sometimes a sense of weight or dull pain in the back; but this is by no means a constant symptom. There is also occasional irritation about the neck of the bladder, which sometimes extends along the urethra. The functions of the skin appear to be natural; at least in every case which has come under my own observation perspiration has been rather easily induced. The pulse is not affected. There is no remarkable thirst, nor craving for food, except in extreme cases, nor are the functions of the stomach and bowels much deranged; hence for the most part the tongue is clean, and the dejections regular and apparently natural.

"In most of the cases of this disease which have hitherto fallen under my own immediate observation, the subjects have been middle-aged men, of thin and spare habit, with a sort of hollow-eye, anxiety of expression in their countenance; free

from gout and constitutional disease in general, and, as far as could be ascertained, from any organic defect in the urinary organs. In every instance they had been induced to apply for medical advice, not so much from the pain, as from the inconvenience of the disease, and the dread of its ending in something worse; and, what may be worth remarking, in several instances confessed that they had been addicted to masturbation from very early youth.

"With respect to the causes of this affection, they are doubtless very various; whatever debilitates the system, and particularly the urinary organs, may give origin to it. Hence it may be induced by all those circumstances which gave origin to albuminous urine, diabetes, and the deposition of the phosphates, with which diseases, as we shall find hereafter, it seems to be intimately connected."

The author relates two cases of this kind, one of which we condense, as illustrative at once of the character of the disease and of the author's mode of treating it.

March 6th. The patient aged forty-five. Symptoms resembling those of diabetes; constant craving for food; sense of cold over the body; he passed sixteen pints of urine in twenty-four hours. The urine contained a large quantity of urea, but no saccharine matter; and crystals of lithic acid were deposited. Ordered gr. 1½ opii bis die. March 20th, much better; only two pints of urine passed in twenty-four hours. Soon after this date the patient became so well that he did not return to the hospital till Aug. 19th. He was now very weak, and felt as ill as ever, but the quantity of urine discharged in twenty-four hours did not exceed four pints. By the employment of opium his health again mended rapidly.

In most instances of this disease, our author derived decided advantage from opium. Purgatives and alteratives also proved beneficial, but stimulating articles always proved manifestly injurious.

Chap. III.—*Diabetes.* The author restricts the term *diabetes* to those affections in which the urine is *saccharine;* and

hence he defines diabetes to be a disease, "in which a saccharine state of the urine is the characteristic symptom." Diabetic urine is almost entirely free from urea, and contains little or no lithic acid. "The usual saline matters existing in healthy urine are met with in diabetic urine in nearly the same relative proportions, but their absolute quantity is very much diminished."

The constitutional and other affections accompanying this disease are thus summarily enumerated by Mr. Watt:

"The appetite is usually better than in health. Uneasiness in the stomach after meals; thirst urgent; the mouth dry and parched; tongue white and foul, sometimes unnaturally clean and red; tough disagreeable mucus in the throat; depraved taste; skin dry and unperspirable; considerable emaciation; weariness and aversion to exercise; loss of strength; pain and weakness in the region of the kidneys; irregular, generally costive state of bowels; some degree of inflammation and uneasiness about the external orifice of the urethra; loss of virility; chilly state of body; cold feet; a tendency to œdema; heat and uneasiness in stomach and bowels; acid eructations; flatulence; eyes muddy and painful; indistinct vision; vertigo; head-ach; dyspnœa on the least exertion; gums spongy and ulcerated; weight and tenderness about the præcordia; a tendency to sigh; listlessness; mind weak and peevish; spirits greatly exhausted. The breath (and frequently the person of the patient) exhales a peculiar *hay-like* smell. The pulse variable, but generally in the latter stages, weak, and sometimes irregular."

This disease, says the author, must be considered in a twofold light:—"first, simply as a saccharine state of the urine, without any regard to quantity; and, secondly, as a similar condition of the urine, accompanied by more or less *diuresis*." The existence of the first of these forms of disease, namely, a *saccharine* condition of the urine without *diuresis*, is, he thinks, "somewhat hypothetical:" yet he thinks that such a form of the disease *may* exist, since diabetes may be so far cured as to reduce the quantity of urine to its natural stand-

ard, and relieve all the usual symptoms of the disease, "*and yet the urine remain saccharine.*" In corroboration of this opinion, the author states that he has seen a case "in which the usual symptoms of diabetes subsequently manifested themselves in their worst form, and in which the patient's attention was attracted by the peculiar *qualities* of the urine long before its *quantity* struck him as any thing remarkable." Our author does not mean to assert, however, that a saccharine state of the urine *always* precedes *diuresis* in this disease; but he thinks it probable that this is *sometimes* the case. A natural predisposition to the disease exists in some individuals, and this predisposition appears even to be hereditary. Four distinct instances of this kind have come under our author's observation.

"The first was that of a young gentleman between twenty and thirty years of age, whose mother and uncle had died of the disease, and who feared that he laboured under the disease himself, as he appeared to have some of the symptoms. On examining the urine, however, I found no saccharine matter, but a great excess of urea, which seems to constitute the first step, in some instances, towards the presence of saccharine matter; but independently of this, the circumstance that two individuals, brother and sister, of the same family, died of the disease, is sufficient to mark the *family* nature of the affection. The second case was that of a lady about fifty years of age, whose brother or sister, I do not remember which, had died of the same disease. The third case was that of a young girl about ten years of age, in whom the disease proved fatal, and whose father, two or three years before, had died of a similar affection. And it may be remarked, that in August last I was requested to examine the urine of another girl of the same family, and about the same age, who it was feared had a tendency to the same affection. The urine contained no sugar, but a great excess of urea, thus clearly marking the tendency to the affection. The fourth instance was that of a gentleman who died of this affection at the age of fifty-four, and whose father for many years before his death was stated to have laboured under the same disease. What is remarkable

and well worth mentioning, this gentleman's son, who was about thirty years of age, stated that he was much troubled with lithic acid gravel."

We have ourselves seen a remarkable example of this kind. About four years ago we attended a young man affected with this disease, who after suffering from it for about six weeks, died in a state of extreme emaciation. He informed us that one of his brothers and his mother had in the course of five or six years died of this complaint. Dr. Parrish saw this patient with us.

"From these circumstances, then, and others that, perhaps, might be mentioned, I am induced to believe, that a tendency to this affection, frequently inherited, and amounting perhaps, in some instances, to an actual saccharine condition of the urine, exists in certain individuals, which on being roused or called into action by some favourable exciting circumstance, such as exposure to cold, or any thing inducing feverish or inflammatory action, becomes for the first time complicated with diuresis, and thus assumes all the well known characters of diabetes.

Treatment.—General blood-letting, says our author, will, often be necessary in recent cases of an acute character; but in very protracted cases, where the debility is great, this remedy can seldom be required. It appears from the observations of Mr. Watt, that the pulse cannot be generally relied on as an indication of the propriety of venesection. "In one case related by this writer, the pulse was slow, feeble, and irregular; the strength and spirits almost gone; the lower extremities œdematous, cold and lifeless; the blood very dark, crassamentum as black as pitch and devoid of tenacity; and *yet the lancet did great good.* The state of the blood in this case forbade the practice; yet the bleeding was repeated six times, and it was not till the fourth that it was changed, and the crassamentum became dense and sizy on the top; on the fifth the buffy coat was contracted; the sixth it was still

firmer. The patient felt better after every bleeding, and after the fifth all the symptoms were removed."

Frequent local bleeding from the epigastric regions, says Dr. Prout, has been found beneficial. Aperients also should be so employed as to keep the bowels freely open. He thinks castor oil the best article for this purpose. Saline cathartics are in general injurious on account of their tendency to stimulate the kidneys. Mercury, too, is an article which should be cautiously employed. "When mercurial alteratives are necessary, says the author, the *hydrarg. cum creata* seems to be the best adapted to the purpose. Opium is frequently an indispensable remedy in this disease; particularly in cases attended with much nervous irritability: "and of all the preparations of opium, says the author, the *pulv. ipecac. compos.* from its well-known property of determining to the skin, appears to me to be the best suited to the purpose." Opium, however, cannot be prudently given in cases of an acute character without the previous abstraction of blood.

"In cases of a chronic character, and accompanied by much debility and nervous irritation, I have seen the very best effects produced by a combination of the preparation of opium above mentioned, and full doses of the *carbonas ferri*, exhibited in the form of an electuary, made with the *albumen ovi*. In such cases, as the patient recovers, the quantity of the sedative may be gradually diminished, while that of the tonic (provided nothing contra-indicates its use) may be increased."

Together with the above remedies various applications to excite the functions of the cutaneous exhalents, are often decidedly beneficial. The warm bath, frictions with the flesh-brush, or dry flannel will generally answer this purpose better than any other means. Flannel should be constantly worn next the skin. "But of all means," says the author, "attention to diet and regimen seems to be of the most importance in the treatment of diabetes." The quantity of fluid

taken by the patient should be as small as possible, "for if he be permitted to drink ad libitum we can scarcely hope for benefit from any remedy." The author thinks that the purer the water,—that is, the freer from foreign substances it is, the better will it answer as a drink for diabetic patients. As a general rule all drinks should be taken in a *tepid* state, "as the patient, whose craving is generally for *cold* drinks, will thus content himself with less." Drinks should not be taken when the stomach is loaded with solid food.

The diet should consist wholly of animal and farinaceous substances; and saccharine and acid matters should be most rigidly avoided. Care must also be taken not to allow the patient to take much food at a time.

"I believe," says the author, "the greater number of cases of sudden death in this affection (which is by no means an uncommon termination of it,) have been distinctly referable to errors either in the quality or quantity of the food, or both; that is to say, the patient has been generally cut off after a *hearty meal*, as it is vulgarly termed. As a general rule with respect to diet, I should say, that a quantity greater or less, according to circumstances, but always *strictly regulated*, should be taken at periods of four, five, or six hours; and that at the time of taking solid food, and for an hour or two afterwards, all drink should be abstained from as much as possible. Were I to particularize the species of food, I should say generally, that mutton or beef, plainly cooked, and particularly mutton-chops or beef-steaks, rarely done, should be taken twice in the twenty-four hours, and that the other meals should consist of any simple article that can be prepared from farinaceous matters with milk, eggs, &c. only.

CHAP. IV.—*Description of Urinary Gravel and Calculi, with a summary account of their Chemical Composition, &c.*

1. *Pulverulent or amorphous sediments.*—These sediments are held in solution in the urine, when it is discharged;

but as the urine cools they are deposited in the state of a fine powder. Their colour, for the most part, is red, "diluted with more or less of brown or yellow." Their composition too is various, but "generally speaking they may be stated to consist of two species of neutral saline compounds, viz. the *lithates* of ammonia, soda, and lime tinged more or less with the colouring principle of the urine, and with the purpurates of the same bases, and constituting what are usually called *lateritious* and *pink* sediments; and secondly, the phosphate of lime, and the triple phosphate of magnesia and ammonia, constituting for the most part sediments nearly white."

2. *Crystallized sediments, or gravel.*—This form of sediment is generally voided with the urine in the form of small grains or crystals. These crystals consist, first, of lithic acid; second, triple phosphate of magnesia and ammonia; and third, oxalate of lime. The first are always more or less red; the second kind are always white; and the last of a dark blackish green colour. These different forms of urinary gravel are "*never voided together in the same urine.*"

3. *Solid concretions or urinary calculi.*—The author enumerates thirteen species of urinary calculi, viz.

1. *Lithic acid calculus.*—Colour, brownish red or fawn, occasionally approaching to that of mahogany. Surface smooth, sometimes tuberculated, structure consisting of concentric laminæ. By the assistance of heat the lithic acid dissolves in nitric acid; "and if the solution be evaporated to dryness, the residue assumes a beautiful pink or carmine colour."

2. *Lithate of ammonia calculus.*—Generally of a clay colour; smooth, sometimes tuberculated; fracture earthy, composed of concentric layers. Dissolves readily in the alkaline sub-carbonates; when heated with caustic potash it gives off a strong smell of ammonia.

3. *The oxalate of lime, or mulberry calculus.*—Colour, dark brown, approaching to black; surface rough and tuberculated; texture imperfectly laminated; expands into a white

mass before the blow-pipe, which when moistened stains turmeric paper red.

4. *Cystic oxide calculus.*—Colour, yellowish white; surface commonly smooth, exhibiting a crystallized appearance; texture confusedly crystallized; fracture glistening, "like that of a body having a high refractive density." Small pieces semi-transparent; emits a peculiar odour before the blow-pipe, readily soluble both in acids and alkalies.

5. *The bone-earth, or phosphate of lime calculus.*—Generally pale brown; surface very smooth; structure regularly laminated—the laminæ being striated in a direction perpendicular to the surface. Soluble in muriatic acid; but infusible by the heat of the blow-pipe.

6. *Triple phosphate of magnesia, and ammonia calculus.*—Always nearly white; surface commonly uneven, and covered with small shining crystals; friable; not laminated; emits the odour of ammonia before the blow-pipe, and at length melts; soluble in dilute acids.

7. *The calculus composed of a mixture of the phosphate of lime, and triple phosphate of magnesia and ammonia, or the fusible calculus.*—Very white and friable, like chalk; *generally* not lamelated; sometimes separates readily into laminæ. Occurs very frequently; the unlamenated variety often acquiring a very large size. It melts easily before the blow-pipe, and is very soluble in acids.

8. *The alternating calculus.*—Consists of different layers of some of the preceding species. Most commonly the nucleus consists of lithic acid, and the external crust of the fusible calculus. The size is often very large. Three or even four different varieties sometimes enter into its composition.

9. *Mixed calculi.*—Composed of an *intimate* mixture of two or more of the preceding species. Colour various; generally not laminated and hard; seldom of large size.

10. *Carbonate of lime calculus.*—Very uncommon, and always quite small; perfectly white and friable.

11. *The xanthic oxide calculus.*—"Of which only one specimen seems to have been observed."

12. *The fibrinous calculus.*—Composed apparently of the fibrin of the blood. The two preceding varieties are uncommonly rare, and were first noticed by Dr. Marcet.

13. *The prostate calculus.*—Consists chiefly of phosphate of lime.

CHAP. V.—*Data showing the comparative prevalency of the different forms of Urinary Deposite, &c.*

According to the data furnished by the author, it would appear that one-third of the whole number of calculi are of that kind in which the lithic acid predominates. Those composed chiefly of the oxalate of lime or the mulberry calculi, constitute rather less than one-seventh of the whole number. The cystic oxyd calculi are exceedingly rare; occurring in the proportion of one to two hundred and seventy-four. One-fourth of the whole number of calculi consists of the phosphates. It appears that between one-fourth and one-fifth of the whole number belong to the class of the *alternating* calculi. "This calculi," says the author, "constitute by far the most interesting and important species of calculi, in a pathological point of view, since they present us with a faithful record of the order of succession of the different diathesis, &c.

"Out of eight hundred and twenty-three calculi, the aggregate of all the collections, only *three* specimens are stated to exist in which the phosphates have been followed or surrounded by other calculus deposites. Hence it may be laid down as a general law,

"*That in urinary calculi a decided deposition of the mixed phosphates is not followed by other depositions.*

"To this important law there are certainly very few exceptions; and in all the numerous calculi that have fallen under my own observation, I do not recollect a decided instance of one; for in every case in which there appeared at first sight to

be an exception to it, this was found, upon a closer examination, to be more apparent than real. The following is a description of a calculus constituting such an apparent exception. The nucleus was composed of a loose aggregate of particles, consisting principally of the lithate of ammonia, of a pale brown colour. Round this was deposited a layer of considerable thickness, composed almost entirely of the same substance, but hard and compact; without this was deposited an imperfect lamina of the triple phosphate of magnesia and ammonia; and beyond this, several thin and irregular laminæ of the lithate of ammonia and triple phosphate, intimately intermixed with one another: lastly, the whole was covered by a layer of the triple phosphate of magnesia and ammonia, perfectly white, and of a crystallized texture, and consequently nearly pure. Hence this hardly constituted an exception to the general law; for, as will be hereafter shown, the lithate of ammonia seems to constitute, as it were, the intermediate link between the lithic acid and phosphates."

However various in their composition and appearance, it may be readily perceived, says the author, that all calculi are in fact made up of the four following elementary substances, viz. 1. *The lithic acid and its compounds.* 2. *The oxalate of lime.* 3. *The cystic oxyde; and* 4. *The earthy phosphates.* We seldom, if ever, find more than *one* of these principles in excess in the urine at the same time; "hence they may be supposed to represent so many distinct diatheses or conditions of the system requiring to be separately considered."

CHAP. VI.—*Of the Lithic acid, Diathesis in general, &c.*

The amorphous sediments, as has been already observed, consist of lithic acid in combination with some base, generally *ammonia;* and a deposition of such sediments is indicative of an *excess* of the lithic acid in the urine. The exciting causes of an excess of lithic acid, are, according to our author, of three kinds, viz. 1. "Simple errors in diet. 2. Unusual or unnatural exercise either bodily or mental, particularly

after eating, and want of proper exercise at all other times; and 3. Debilitating circumstances."

In relation to wholesome diet, it has been observed, that an excess of *lithate* of ammonia is *invariably* produced by an unusually *full* meal of animal food or bread; by an abrupt change in the time of eating; and frequently, "by partaking of food to which the person has not been used. Whatever is difficult of digestion also is apt to increase the deposition of lithate of ammonia."

The amorphous sediments are very various in colour; but as it would be impossible to point out all those modifications, the author considers them under three heads only—namely, 1. *Yellow.* 2. *Red* or *lateritious*, and 3. *Pink* sediments.

The first variety vary from nearly white to the *wood-brown* of Werner. This class of sediments, says the author, may be termed the *sediments of health.* There are few individuals whose urine does not occasionally deposite this variety of sediment. Children are particularly subject to it. When it becomes excessive it is frequently the forerunner of gravel or calculus.

The red or lateritious sediments vary in tint from nearly white to a deep brown. The presence of this class of sediments is almost always connected with an inflammatory, or febrile state of the system. "The deeper the colour of the sediment and the more approaching to *red*, the more severe in general are the symptoms." Persons who are very subject to this form of urinary sediment are naturally of a feverish, irritable habit, and easily affected by slight causes, "such as trifling errors in diet, a chilly state of the atmosphere, &c."

Pink sediments.—These, like the other varieties, consist essentially of lithate of ammonia. They occur in dropsical patients, and occasionally in hectic fever. The colouring matter of the amorphous sediments is derived from two sources; first, the natural colouring principle of the urine,

and second, the *purpurates*, "a class of substances not existing in healthy urine, but in that only of persons labouring under fever."

"Such," says our author, "is an outline of the circumstances which have been observed respecting those amorphous sediments composed principally of the lithic acid. To render them, if possible, still more distinct, I shall briefly recapitulate them: Amorphous sediments owe their colours to two classes of substances, differing from one another; the first of these is, apparently, an ingredient of healthy urine, and helps to impart a yellow colour to that fluid. This ingredient is liable to be very much increased in active inflammatory fevers, though, of course, its presence does not necessarily indicate fever. The second source of colour is the purpurates, a class of substances not existing in healthy urine, but in that only of persons labouring under fever. These two substances naturally give rise to three varieties of sediments: 1. Lithate of ammonia tinged by the colouring matter of the urine only, and not necessarily indicating fever; 2. Tinged by a mixture of an excess of the same ingredient, and more or less of the purpurates, indicating for the most part active inflammatory fever; and, 3. Tinged by the purpurate of ammonia only, indicating general fever, of an irritable nature, as *hectic?*"

On the subject of crystallized sediments our author makes some very interesting observations.

These sediments consist of nearly pure lithic acid, and exist in a state of solution in healthy urine at all ordinary temperatures. When, however, a *free* acid is generated by the kidneys, the lithic acid is precipitated in the form of minute crystals, constituting this form of urinary sediment. The precipitating acid is most commonly the *muriate*, sometimes the *phosphoric* or *sulphuric*. Our author has never seen this form of sediment of a *pink* colour—it is generally more or less lateritious. The general symptoms attending crystallized sediments are—more or less pain in the lumbar region; irritation and sense of heat at the neck of the bladder and urethra;

frequent desire to micturate—the urine being passed in small quantities "and without affording the usual relief, the sensation of something being left behind in the bladder." Children are exceedingly liable to lithic deposites in the urine. There is less disposition to the formation of deposites of this kind between the age of puberty and forty-one, than at any other period of life.

"About the age of forty an important change commonly takes place in the constitution, which, for the most part, materially influences the disposition of lithic acid in the urine. It will be generally now observed that the lithic acid is apt to be deposited at intervals in larger quantities than usual, and that for some time previously to this occurrence there is more or less of feverish indisposition and derangement of the general health: about this period of life also there is a disposition in the constitution, at the above periods particularly, to separate the lithic acid in a concrete state, thus giving origin to the formation of renal calculus, and the consequent train of secondary symptoms, to be detailed presently, when we come to speak particularly of that occurrence. These circumstances are most liable to take place in those individuals who have all their lives been subject to lithic acid deposites, but they not unfrequently occur also at the period of life we are considering, in those who have never previously suffered from these affections, but who have lived luxuriously and indolently, or who inherit a tendency to gout, though they have never, perhaps, had an open attack of that disease.

"Whoever has much attended to urinary diseases must have remarked the circumstance above alluded to, viz. that patients subject to derangements of the general health, connected with urinary deposites, seldom feel so well with respect to the former, as when lithic acid gravel is deposited in the urine. Now this circumstance is even more strikingly illustrated by those attacks of gravel that are apt to commence about the period of life we are considering. Thus we shall frequently find, that patients who had previously for months, or even years, been subject to various anomalous nervous affections and pains in different parts

of the system, accompanied by great derangement of the digestive functions, will suddenly obtain relief from the whole by a discharge of lithic acid gravel in the urine, or, perhaps, a small renal calculus. Now, although it would be absurd to consider the lithic acid in such cases as the real *materies morbi*, yet, in many instances, about this period of life, we may begin to consider it as the symbol or representative of such a *materies*, and treat it accordingly: that is to say, we may frequently produce much relief to the system at large by promoting or producing artificially a discharge of lithic acid with the urine, as will be pointed out more particularly when we come to speak of the treatment of these affections."

About the age of sixty or seventy "another change takes place in the mode in which the lithic acid is separated from the system." At this period the urinary organs are apt "to participate in the general decay of the constitution," and often become organically diseased. Under these circumstances, instead of pure lithic acid crystals, "impure or imperfect lithic acid, in the shape of minute globules of various sizes, will be separated from the kidneys in great abundance."

The following remarks of our author, on the circumstances which usually attend the formation of a nephratic calculus, are ingenuous and interesting:

"The urine of those individuals who possess a disposition to the disease, continues, as just observed, for a great length of time, perhaps almost constantly, to deposit lithic acid in some form or other. This being accompanied by no very remarkable or severe symptoms, often escapes their observation; they proceed, therefore, in their usual habits, while the disease insidiously continues to gain ground daily: at length, about the age of forty, the affection begins to assume its most aggravated form, and both crystallized and amorphous sediments appear in the urine, sometimes in enormous quantities: at the same time a peculiar state of the system, accompanied by fever, and closely resembling that present in gout, to which it is generally referred, comes on; the urine is now very much diminished in quan-

tity (often amounting almost to suppression,) its specific gravity unusually great, its colour very deep, the sediments unusually large (or occasionally they disappear altogether;) and under these circumstances lithic acid is separated by the kidney in the state of a semi-fluid hydrate, which becoming solid gives origin to renal calculus. During the above state there is commonly a sense of dull pain or weight in the region of the kidney and just above the pubes; but as these are not particularly severe, they are little attended to; and after a few days the whole gradually subside, or perhaps terminate in an attack of the gout. Sooner or later after the above symptoms, but commonly not till they have subsided, and the urine has begun to be secreted in its usual quantity, the patient is seized all at once, and perhaps without the least warning, with a most acute pain in the region of the kidney, accompanied by violent sickness and vomiting, and other symptoms, to be hereafter described, when we come to treat of the mechanical effects of these concretions."

"In recapitulating the circumstances which give origin to these sediments, in general it may be stated, that they are of two general descriptions, *natural* or *acquired*. With respect to those of the first description, it cannot, I think, be doubted, that certain individuals are much more liable to these sediments than others. This tendency, as before remarked, with respect to urinary affections in general, is not unfrequently inherited; thus, I knew a family where both the grandfather and father appeared to have lithic calculi in the bladder; and where the grandson has a very strong tendency to the same disease; his urine depositing frequently very large quantities of lithic acid, both in the form of amorphous and crystallized sediments. Sir Gilbert Blane has remarked also, that he has frequently observed calculus complaints connected with cutaneous affections, and 'particularly with those impetiginous affections which depend on an hereditary constitution, and incident to what is called a scorbutic habit.' Now this precisely accords with my own observations, not only with respect to urinary diseases, but with respect also to organic affections in general of the urinary organs; and I had made the remark long before I was aware that

it had been noticed by any one else: I think I have also remarked, that individuals who are subject to urinary derangements, are apt to be liable to that dangerous affection termed *diffuse* inflammation, which consists in a gradual extension of inflammatory action, from a trifling wound, over the whole system. On the other hand, the disposition to generate these sediments in excess, is, like gout, or rather simultaneously with gout, but too frequently acquired by indolent habits, and excess in eating and drinking. Most frequently, however, the tendency to these diseases is connected with some unknown causes peculiar to certain districts or countries, as, for example, the district of which Norwich may be considered as the centre, in which more calculous cases occur than in the whole of Ireland or Scotland. In such instances, the water, diet, temperature, &c. of the district has been each accused, in its turn, of being the exciting cause; and that hard waters, in conjunction with other favourable circumstances, have a great influence in producing this affection, I have no doubt. I have also in one or two instances seen a fit of lithic gravel induced in the predisposed by sitting on a damp cold seat for some hours; and sometimes a tendency to deposite large quantities of lithic acid is evidently connected with local injury or disease of the kidney."

In relation to the means which may be employed for counteracting this class of urinary diseases, our author observes, that where the sediments are of the *amorphous* kind, an attention to the diet is of primary importance. "The error of *quantity* in diet," he says, "is of infinitely more importance than the error of *quality*." The articles of food most injurious are, "heavy unfermented bread; hard boiled and fat puddings; salted and dried meats; ascescent fruits and soups of every kind." Malt liquors and wine also are improper. Flannel wore about the loins will often be found serviceable; and an attention to the regular action of the bowels is indispensable.

When the urinary deposite is of the crystallized lithic acid kind, along with the regimen already mentioned, *alkaline* remedies are particularly indicated. To be really beneficial,

however, the alkaline remedies must be given in conjunction with *alteratives* and purgatives.

"Thus the pil. submur. hydrarg. com. or a pill composed of the pil. hydrarg. and pulv. antimonialis may be taken twice or thrice a week at bed time, and followed up the next morning by an active dose of the sub-sulphate of magnesia; or a mixture of Rochelle salts and magnesia, or carbonate of soda. A little of either of these compounds may be also taken twice or thrice in the day, so as to keep the urine constantly neutral or alkaline, and the bowels freely open; or gr. x. to xx. of magnesia may be taken for the same purpose in a glass of soda water, as often as it may be found necessary."*

"We have said that about the age of forty the lithic acid may not inaptly be considered as a sort of *materies morbi;* that is to say, the cause of irritation in the constitution, whatever it may be, seems to be transferred to the kidneys, which are thus induced to secrete an extraordinary quantity of lithic acid, and by this means to give great relief to the system at large. Upon this principle it is, that the good effects long ascribed to certain remedies of the active diuretic kind may be probably explained; such remedies appearing to possess the power, when given in certain favourable conditions of the system, of exciting the kidneys to secrete large quantities of lithic acid, and, in this way, by bringing about a sort of artificial crisis, to produce great temporary relief. Thus, Dr. Henry has mentioned cases in which *several ounces* of lithic acid were brought away in the course of

---

* "Sir G. Blane, in the essays above quoted, first pointed out the effects of saline compounds containing a vegetable acid in rendering the urine alkaline; but this circumstance seems to have attracted little attention, and indeed even at the present time is, I fear, very far from being generally known; otherwise the common saline draught would be exhibited with a little more caution than it sometimes is in urinary and vesical diseases. In most cases of the form of disease we are now considering there is not a more effectual remedy; but in other states of urinary disease, were I required to name the remedy calculated to do the most mischief, I should name the common saline draught, formed of potash or soda, *and some vegetable acid.* This subject will be considered more fully hereafter."

a day or two, by a remedy apparently composed of turpentine and laudanum chiefly.

"In remedies of this class, opium, not only on account of its sedative properties, but likewise from the property it possesses of increasing the secretion of the lithic acid, should probably, in most instances, form a constituent principle; but the diuretic ingredients may vary. Thus instead of turpentine, a combination of muriatic acid and opium will sometimes answer very well, particularly when the lithic acid is not disposed to concrete, but comes away in the form of gravel; or the terebinthine remedy may be conjoined with the acid and opium. When, on the contrary, the lithic acid is more disposed to concrete, the muriatic acid may be omitted, and potash may be substituted, by which means the lithic acid will be held in solution; and this, perhaps, in most instances, is the safer combination. To this class may be likewise referred many of the ancient and still popular remedies in gravelly affections, such as the seeds of the wild carrot, the parseley breakstone (*alchemilla arvensis,*) &c. many of which produce a large secretion of lithic acid in particular states of the system. Even *hard waters*, however paradoxical it may appear, sometimes do good on the same principle; and by acting as diuretics bring away large quantities of gravel, as I have known more than once happen. Occasionally, however, a mere change of water, not only from soft to hard, but the reverse, will have the same effect."

In the 7th chapter the author treats of the *oxalate of lime diathesis;* and the 8th is taken up with an account of the *cystic oxide diathesis.* We pass on, however, with our analysis to the 9th chapter, which is devoted to the more important subject, "*of the phosphatic or earthy diathesis.*" The deposition of the phosphates, says our author, is rarely an original disease. It is almost invariably "consequent to the other forms of urinary deposition," particularly of those of the lithic acid and oxalate of lime. The *crystallized* phosphatic sediments *almost* constantly consist of the *triple phosphate of magnesia and ammonia,* "and exist in the form of perfectly white shining crystals." The constitutional

symptoms are usually derangement of the digestive organs; much nervous irritation; pain or uneasiness in the back or urinary organs; with a sense of general lassitude and want of energy.

"The urine in this form of disease is generally abundant in quantity, and for the most part pale coloured (though there are exceptions to this,) and upon standing for some time, an iridescent pellicle is frequently formed upon its surface, which upon examination proves to be crystallized, and is composed chiefly of the salt in question. Minute crystals of the same salt also frequently attach themselves to the sides of the vessel in which the urine has stood for a short time. Urine abounding in this salt is often of considerable specific gravity, contains abundance of urea, and is very apt to become alkaline and putrescent. Sometimes, on the contrary, the specific gravity is lower than natural. When this salt abounds very much, the crystallized deposite is formed before the urine is discharged from the bladder, and consequently immediately subsides to the bottom of the vessel in which it is passed; in this case the urine is alkaline when voided; most generally, however, the crystals do not begin to form till the urine has become cool, and sometimes not till it has begun to putrify; and these circumstances indicating the periods when the urine become alkaline, may be considered as pointing out the degree of severity of the disease."

The *amorphous* phosphatic sediments, says our author, invariably consist "of a mixture of the phosphate of lime, and of the triple phosphate of magnesia and ammonia."

When in this triple compound the phosphate *of lime* predominates, the symptoms are almost always decided and severe. The symptoms which characterize this form of urinary deposition are often very distressing.

"They consist in great irritability of the system, and derangement of the chylopoietic viscera in general; such as flatulency and nausea, obstinate costiveness, or peculiarly debilitating diarrhœa, or both, frequently alternating; and the stools are

extremely unnatural, being either nearly black, or clay coloured, or sometimes like yest. These are always accompanied by more or less of a sensation of pain, uneasiness, or weakness, in the back and loins. There is a sallow, haggard expression of countenance; and, as the disease proceeds, symptoms somewhat analogous to those of diabetes begin to appear, such as great languor and depression of spirits, coldness of the legs, complete anaphrodisia, and other symptoms of extreme debility; and the disease if not speedily checked, seems capable of ending fatally. The urine in this form of disease is invariably pale coloured, and, upon the whole, voided in greater quantity than natural. Sometimes (generally, I think, by day) it is voided in very profuse abundance; and in this case is of very low specific gravity; 1.001 or 1.002, for example. At other times it is voided in less quantity, and its specific gravity is proportionally higher, but it is seldom very high, that is, surpassing 1.025. In the former case it is generally perfectly pellucid and colourless, and deposites no sediment; in the latter, it is sometimes opaque when passed, and always after standing for a greater or less time deposites a most copious precipitate of the mixed phosphates, in the state of an impalpable powder. In all cases the urine is extremely prone to decomposition, becomes alkaline by the evolution of ammonia, and emits a most disgusting smell. To those who have never seen this condition of the urine, the above will probably furnish but an imperfect idea. I trust, however, that the description will enable any one to distinguish such urine when they see it; and when they have once paid attention to its properties, they will afterwards readily recognize it."

The causes of this complaint may be either general or local. Our author regards "*some injury of the back*," such as a fall from a horse, or whatever occasions "a violent general concussion of the spine," or some local injury about the back, as a very frequent exciting cause of this affection. Severe and protracted debilitating passions, excessive fatigue, &c. are enumerated among its general exciting causes. "The local causes are, generally some irritation about the bladder or urethra, as for example any foreign substance introduced

into the bladder, including all sorts of calculi under certain circumstances; the retaining of a bougie or catheter in the urethra; strictures of the urethra in some rare cases, and in particular constitutions, &c."

Treatment.—The indications of cure, according to the author, are—"to diminish the morbid irritability of the system, and to restore the state of the general health, and particularly of the urinary organs, by tonics and other appropriate remedies." *Opium* is a remedy of great value in this affection. From gr. i. to grs. v. must be given two or three times a day. "Under this remedy the distressing symptoms will commonly be speedily relieved."

In addition to this remedy, the mineral acids, cinchona, uva ursi, the preparations of iron and other tonics are for the most part indispensable. A large pitch, or soap, or galbanum plaster applied to the loins, will also assist materially in relieving the distress felt in that part. The bowels are difficult to be regulated in this form of disease. Though frequently constipated, they do not always admit of purgatives, particularly of the active kind. The author has known the most serious consequences from the action of a small dose of calomel. Saline purgatives, particularly such as contain a vegetable acid, must be avoided. Castor oil in small doses and laxative injections answer well. Mercury is capable of doing a great deal of mischief, especially when it acts on the system generally. Above all, *alkaline* remedies must be carefully avoided; nor can *diuretics* of any kind be employed without running a risk of doing much harm.

"In less severe cases the hyoscyamus is an excellent remedy, especially when combined with the extract of *uva ursi*, and more or less, according to circumstances, of the *extr. opii*. The same is true of the *alchemilla arvensis*, a strong infusion of which, taken frequently, sometimes gives great relief. In such cases, also, occasional purgatives, especially those of the milder class, may be employed with safety and advantage. Indeed in some of the diseases of children, in which the triple phosphate in par-

ticular is copiously deposited, repeated purgative doses of calomel and rhubarb are of the utmost utility. These diseases may be commonly distinguished by the absence of the severe symptoms above mentioned, and by the high specific gravity of the urine."

The diet should be mild and nutritious, and taken in moderate quantities. Our author is inclined to recommend "an animal diet in preference to an acescent vegetable diet." No remedies, however, will do much if the *mind* cannot be set at rest. "The influence of mental anxiety," says the author, "is really astonishing in this disease; and absence from care, the exhilarating air of the country, and such exercises as are consistent with the patient's condition will, perhaps, more than any thing else, contribute to the cure."

The remaining portion of this volume embraces an account of the symptoms of urinary calculi when lodged in the kidney and bladder, with some interesting observations on various other diseases of the urinary organs, occasionally produced by or liable to be mistaken for calculus affections. Our author dwells particularly on the great importance of attending to the state of the urine in these affections. His chapter on the "data, showing the periods of life, sex, &c. most subject to calculous affections, and the mortality attending the operations of lithotomy, with remarks on the circumstances in which lithotomy ought or ought not to be performed, is full of interesting and valuable matter.

For the following data, respecting the periods of life in which persons appear to be most subject to calculous affections, our author acknowledges himself principally indebted to Dr. Marcet and Mr. Smith.

												Consisting of		
												Males.	Females.	Total.
Under 10 years	Age.	1	2	3	4	5	6	7	8	9	10			
	Cases.	0	*1	17	22	20	14	17	7	25	13	134	2	136
Between 10 and 20	Age.	11	12	13	14	15	16	17	18	19	20			
	Cases.	11	16	10	5	4	5	2	5	5	2	62	3	65
Between 20 and 30	Age.	21	22	23	24	25	26	27	28	29	30			
	Cases.	7	3	1	4	4	2	4	2	4	4	34	1	35
Between 30 and 40	Age.	31	32	33	34	35	36	37	38	39	40			
	Cases.	4	4	3	1	3	5	4	4	3	3	33	1	34
Between 40 and 50	Age.	41	42	43	44	45	46	47	48	49	50			
	Cases.	4	3	4	4	4	3	2	3	2	8	37	0	37
Between 50 and 60	Age.	51	52	53	54	55	56	57	58	59	60			
	Cases.	3	3	2	5	1	3	4	3	1	3	28	0	28
Between 60 and 70	Age.	61	62	63	64	65	66	67	68	69	70			
	Cases.	1	2	4	1	1	2	1	1	3	2	18	0	18
Between 70 and 80	Age.	71	72	73	74	75	76	77	78	79	80			
	Cases.	0	0	0	0	1	0	0	0	1	0	2	0	2
											General Totals,	348	7	325

"The foregoing table is taken from Mr. Smith's valuable paper, and represents the number of cases of operation for stone at all ages, which have occurred in the Bristol Infirmary.

"The following table, of similar import, though less extensive and perfect, is taken from the same excellent paper. The district is of that of which the town of Leeds forms the centre, and the data are taken from the surgeons' books of the Leeds Infirmary:

10 years and under	-	83 Cases.
Between 10 and 20	-	21
20 and 30	-	21
30 and 40	-	12
40 and 50	-	28
50 and 60	-	21
60 and 70	-	9
70 and 80	-	2

Consisting of Males 188, Females 9. Total 197

* No operation.

"During a period of forty-four years, namely, from 1772 to 1816, according to Dr. Marcet, the following is a summary of the returns of cases of lithotomy in the Norfolk and Norwich hospital:

	Consisting of		
	Males.	Females.	Totals.
Children under 14 years	227	8	235
Adults - - -	251	20	271
Totals	478	28	506

"The following table presents a general view of these data; and, as far as they can be exhibited, of the proportions of stone cases before and after puberty, and of their occurrence in the different sexes:

	Bristol.	Leeds.	Norwich.	Total.	Consisting of	
					Males.	Females.
14 years and under	178	96*	235	509		
Above 14 years	177	101	271	549		
	355	197	506	1058	1014	44

In relation to the degree of mortality from the operation of lithotomy, our author presents his readers with the following interesting data and observations:

"The following is a summary of the most perfect data we possess on this subject. The first and most complete table is taken from Mr. Smith's paper, so often quoted, and represents the mortality from lithotomy, as it has occurred at different ages in the Bristol Infirmary:

Age.	Rate of Mortality.	
10 years of age and under	1 in 4½	
Between - 10 and 20	1 - 5	
20 - 30	1 - 7	
30 - 40	1 - 5	
40 - 50	1 - 3⅓	
50 - 60	1 - 4⅓	
60 - 70	1 - 2½	
70 - 80	1 - 2	
Mean at all ages.	1 - 4½ or	Before puberty,† nearly as 1 in 4¾ After do.† nearly as 1 in 4 3-14.

* Estimated partly from the proportions in the Bristol tables.

† Partly estimated.

"The following table is also taken from the same paper, and refers to the Leeds district. There occurred in the Leeds Hospital,

	Cases of Lithotomy.		Died.	Rate of Mortality.
From 1767 to 1777	24	of which	2	or 1 in 12
1777 - 1787	62	-	8	1 - 7 3-4
1787 - 1797	23	-	3	1 - 7 2-3
1797 - 1807	42	-	7	1 - 6
1807 - 1817	46	-	8	1 - 5 3-4
Mean at all ages	-	-		1 in 7 4-5

"According to Dr. Marcet, the mortality in the Norwich Hospital for the last forty years has been:

Before puberty - -	1 in 18
After puberty - -	1 - 4 3-4
Or *generally* at all ages -	1 in 11 3-4

"From these data it appears that the mortality from lithotomy has been much less in the Norfolk Infirmary than in either of the others, particularly in the Bristol Infirmary. It also appears, from the Norfolk table, that the *general* risk is less in children than in adults, in the proportion of about four to one; but on the other hand, from the Bristol table, the chances seem nearly equal. These differences are at present inexplicable; but, I think, from the greater number of cases occurring in the Norfolk Hospital, and other circumstances, that the data furnished by that Hospital present the most accurate estimate of the relative mortality before and after puberty, from the operation of lithotomy. If we take the mean of all these data, we shall probably approach very nearly the ratio of mortality, as it occurs from lithotomy, at all ages, over all the whole kingdom:

Mean at all ages, in the Bristol Infirmary -	1 in 4 1-4
Do. in the Leeds - -	1 - 7 4-5
Do. in the Norwich - -	1 - 11 3-8
Mean ratio of mortality -	1 in 7 3-4 very nearly.

"We come now, in the last place, to make a few remarks upon the circumstances which ought to be taken into account, in determining our opinion with respect to the propriety or necessity of the operation of lithotomy.

"1. The operation of lithotomy should in general be performed either immediately or as soon as possible, *a.* in all cases of calculus occurring before puberty, of whatever species they may be; and, *b.* whenever the phosphatic diathesis is distinctly ascertained to be present, or even when the urine abounds with pale coloured lithate of ammonia.

"*a.* Whenever a calculus, no matter of what species, is ascertained to exist in the bladder before puberty, there can, I think, in general, be but one opinion respecting the propriety of removing it. The reasons are so obvious, that they scarcely need to be stated; it will be sufficient to remark, that a long series of inevitable suffering will be thus prevented, the risk of a fatal result diminished, and the chance of a perfect cure rendered greater than in a more advanced period of life. In general it will be better that the operation should be performed immediately; but if the lithic diathesis be steadily present, if the state of the general health be good, and if the sufferings in consequence be moderate, the operation may be delayed till towards the age of puberty, as, from the favourable changes which commonly take place at this period, there will be less risk of the disease returning: but, if the general health appears to have given way, and the patient suffers a great deal of pain and irritation, as is most frequently the case, delays will be exceedingly dangerous. *b.* As to the second point, I give it as my decided opinion, that in all cases where the phosphatic diathesis is fairly established, the operation is the only alternative, and the sooner the better. This opinion is founded on the facts sufficiently, I presume, established by the data brought forward in a preceding part of this volume, from which it appears that this diathesis uniformly *succeeds* to all the others; that it never changes when a calculus exists in the bladder, so as to leave room to hope for a better; consequently that it is the last and worst stage of the disease, and will certainly sooner or later terminate the wretched existence of the patient, if permitted to proceed. The only alternative in such cases, then, is evidently, to remove the calculus as

speedily as possible, before the constitution becomes too deeply affected, and particularly before the bladder becomes diseased, which is one of the most certain and distressing consequences of this species of calculus. Nearly the same remarks apply when the urine is loaded with pale coloured lithate of ammonia, or the disease appears to be in a transition state; as, in this case, I doubt very much, from what I have seen, if the lithic diathesis can ever be fairly re-established, at least while a calculus exists in the bladder.

"2. The operation of lithotomy may be frequently postponed under the following circumstances; namely, when the calculus is small or of moderate size, and of the lithic acid species, and when the lithic acid diathesis is steadily present, and particularly if the patient be in the prime of life, the constitution, &c. sound, and the sufferings comparatively moderate; provided always that the patient will conform to the necessary plan of regimen, &c. calculated to remove or diminish the diathesis, and thus to prevent the increase of the calculus."

With this long extract we close our analysis of the very valuable book before us. In the present edition a great mass of materials are added by the American editor; and although some of the matter thus added, had, we think, better been left out, we cannot hesitate to say that the work is in the main rendered more valuable by the accessions it has received in this edition.

ART. III.—*An Essay on the Application of the Lunar Caustic, in the Cure of certain Wounds and Ulcers.* By JOHN HIGGINBOTTOM, of Nottingham, Member of the Royal College of Surgeons of London. Octavo, pp. 148. London, 1826.

WE have long been in the habit of applying lunar caustic to abrasions of the skin, and to punctured and other slight

wounds, as well as to almost every variety of superficial ulcers; and the benefits which we have derived from this practice have been so manifest, that some of our patients have taken the remedy into their own hands, and are now employing it with hardly any limit or discretion. Until the appearance of the little volume before us, however, we had never thought of investigating this subject so closely as to enable ourselves to explain the exact mode of operation, nor the causes of success and failure which result from the application under different circumstances and on different individuals. We had contented ourselves with the remark, that the action of lunar caustic upon exposed surfaces diminishes their irritability, and of course also their liability to the development of inflammation. Whether or not this effect results from any direct influence of the remedy on the vital properties, or whether it depends altogether on the exclusion of air and other foreign agents from the cellular tissue of the injured part by means of the artificial scab which it forms, we do not even now think it necessary to inquire. Our author has entered so fully into the investigation of this subject, and has given so clear and satisfactory a detail of the results of his observations, that we shall be able to obtain all the necessary information by analysing the contents of his book.

From the manner in which most small wounds and ulcers are disposed to heal by scabbing, Mr. Higginbottom was first led to employ the caustic in similar cases; and our readers will probably suppose that the practice recommended by him, is productive of the same advantages that result from scabbing. But he claims the credit of a great superiority for the caustic, especially when it produces what he calls an adherent eschar, as will be seen in the sequel. The scab is generally irritable and painful, being surrounded by a ring of inflammation. Pus is also very apt to collect below it, and protract the healing process. On the other hand the cauterized surface is totally free from pain and inflammation, provided it prove adherent; and as it is gradually detached, it exposes

the surface underneath in a state of complete cicatrization. The success of the method of healing by eschar is infinitely more certain as well as more speedy than that by scabbing. It also saves the patient much pain and inconvenience, and renders the repeated application of dressings and ointments unnecessary. Its utility will prove extremely great, therefore, when the time of the poor, the expense of an establishment, and the labours of the surgeon as well as the sufferings of the patient require to be considered; and it will, he imagines, be found of no little advantage in all these respects in many cases which are incident to the soldier and the sailor.

Our author considers the subject under the three following heads:—1st, the *adherent eschar;* 2d, the *unadherent eschar;* and 3d, the *treatment by eschar and poultice.*

The adherent eschar will hardly require a definition, inasmuch as its very name indicates its nature. To produce it the lunar caustic should be lightly applied over the surface of a small wound or ulcer, by means of which a white film is first produced, which soon assumes a darker colour, and afterwards becomes perfectly black, from the influence of the light and atmosphere. At the same time the eschar gradually becomes harder, until finally it resembles a bit of court-plaster; and in the course of a few days it becomes corrugated, and begins to detach itself from the edges, leaving the surface underneath completely cicatrized.

To ensure the formation of this kind of eschar it is not only necessary that the caustic should be applied over the whole surface, but it should be extended also beyond the edges of the wound upon the surrounding skin. The eschar contracts when it begins to dry, and may leave a space between its edges and the adjacent skin, open to the contact of the air unless this precaution be observed.

At the same time great care must be taken not to apply the caustic too freely, lest the surrounding skin be vesicated and inflamed. If every part be touched a slight application of the caustic is generally sufficient.

To show the importance of avoiding all such circumstances as may detach the edge of an eschar, he asserts, as the result of all his experience, that in every instance in which the eschar remains adherent from the first application, the wound or ulcer over which it is formed, invariably heals. He accordingly recommends that as fast as the eschar separates from the healed edges of the sore, it should be carefully removed by a pair of scissors.

"To the surface of the wound the eschar supplies a complete protection and defence, and allows the healing process to go on underneath uninterruptedly and undisturbed. It renders all applications, such as plasters, totally unnecessary, as well as the repeated dressings to which recourse is usually had in such cases; and it at once removes the soreness necessarily attendant on an ulcerated surface being exposed to the open air. In many cases too, in which the patients are usually rendered incapable of following their wonted avocations, this mode of treatment saves them from an inconvenience, which is, to some, of no trifling nature.

"It has been already stated how important it is that the eschar should be preserved adherent. To secure this still more effectually, I have found it of great utility to protect it by a portion of gold-beater's skin. The skin surrounding the wound is simply moistened with a drop of water, and the gold-beater's skin is then to be applied over it and over the eschar, to which it soon adheres firmly, but from which it may be removed at any time, by again moistening it for a moment with water; the same bit of gold-beater's skin admits of being again and again re-applied in the same manner.

"The other circumstances which render the eschar unadherent will be mentioned hereafter. In the mean time the fact stated will sufficiently establish the propriety of treating distinctly of the adherent eschar.

"I now proceed to mention some other effects of the application of the caustic. The first is that, in cases in which there would be much and long continued irritability and pain, as in superficial wounds along the shin, all this suffering, and its consequences in

disabling the patient, are completely avoided. A blush of inflammation forms around the eschar, but this gradually subsides without any disagreeable consequences, and the inflammation which would otherwise have been set up, is entirely prevented by the due formation of the eschar.

If inflammation be previously established, it is increased, at first, by the application of the caustic. But if this inflammation be not severe, and if the eschar remain adherent, all inflammation, both that induced by the application of the caustic, and that existing previously, entirely subsides. When the previous inflammation round the ulcer is considerable, however, the application of the caustic would induce vesication, and it should in such a case, of course be avoided, and another mode of treatment to be described hereafter must be adopted."

The *unadherent eschar* is produced, or, in other words, the eschar is prevented from adhering to the subjacent surface, by the formation of pus or of a scab underneath.

"If the eschar be unadherent by subjacent pus, it may be ascertained in the space of from twelve to twenty-four hours; the centre is generally observed to be raised, and to yield to the pressure of a probe; sometimes the subjacent fluid has partly escaped by an opening at the side of the eschar.

"When a scab forms underneath the eschar, which does not happen except the fluid has been allowed to remain too long under the eschar without being evacuated, there are pain and some inflammation, the eschar does not separate, but remains long over the sore, and there is no appearance of healing.

"When it is ascertained that there is fluid underneath the eschar, a slight puncture is to be made by the point of a penknife, the fluid is to be gently pressed out, and the caustic is then to be applied to the orifice thus made. The same plan is to be adopted if the fluid ooze out at the edge of the eschar; it is to be fully evacuated by pressure, and the orifice is to be touched with the caustic. The healing process goes on best, however, when the orifice is in the centre of the eschar. After this treatment the eschar occasionally remains adherent, but more frequently the fluid requires to be evacuated repeatedly, and this

should be done every twelve hours, or once a day, according to the quantity of fluid formed, taking care that the eschar be not needlessly separated by allowing the fluid to accumulate underneath. If, from accident, the eschar is separated before the sore be healed, I would re-apply the caustic. At length the eschar becomes adherent, and in due time begins to peel off, leaving the surface healed.

"In every case in which the eschar does not separate favourably, I begin to suspect the formation of a scab underneath, in which case the whole must be removed by the application of a cold poultice for two or three days; this has not only the effect of removing the eschar, but of allaying any inflammation or irritation; afterwards the caustic must be re-applied as before.

"The gold-beater's skin is more useful as a protection to the unadherent than to the adherent eschar, as the former would be more liable to be torn off by accident than the latter. The gold-beater's skin must be removed in the manner already described, whenever the subjacent fluid is to be evacuated, and must be re-applied after touching the orifice with caustic.

"The pain experienced on the application of the caustic is greater or less according to the sensibility and size of the wound. In small wounds it is trifling, and of short duration; it is more severe in recent wounds than in ulcers: it soon subsides in every case, and then the patient enjoys greater ease than would be experienced under any other mode of treatment. Little or no pain is caused on applying the caustic after evacuating the subjacent fluid of an unadherent eschar. Altogether the pain inflicted by the caustic is far less than is generally imagined, and forms scarcely an obstacle to its employment.

"It may be proper, in this place, to notice such circumstances as render the employment of the caustic improper or inefficient. It is improper to employ the caustic when the ulcer is too large to admit of the formation of a complete eschar; or when it is so situated as to render it impossible that the eschar should remain undisturbed, as between the toes, unless, indeed, the patient be confined to his bed;—or in cases attended by much inflammation, or by much œdema."

Of the treatment by *eschar and poultice* we have had no experience; and the suggestion of this plan is entirely new to us. The following extract contains the views of our author upon this head:

"In many cases in which it is impossible to adopt either the mode of treatment by the adherent or the unadherent eschar, it is of great utility to apply the caustic first, and then a cold poultice made without lard or oil: this plan is particularly useful in cases of punctured wounds attended by much pain and swelling, and in cases of recently opened abscesses. By this application the pain and swelling are much subdued, and a free issue is secured for the secreted fluid; and in no case have I seen the original inflammation increased by it.

"It is generally necessary to repeat the application of the caustic every second or third day, or every day if the inflammation and swelling of the part be considerable, and the cold poultice may be renewed about every eight hours. At length, however, the inflammation having subsided, the attempt may be made to form an adherent eschar.

"I have seen many cases in which, by this mode of treatment, much suffering and perhaps the loss of some of the smaller joints have been prevented, particularly cases of deep seated inflammation of the fingers, which, having been neglected, have issued in severe inflammation, abscess, and terrible fungous growths. In these cases it is not only necessary to apply the caustic to the surface of the sore, but in every cavity or orifice which may be formed by the disease."

In his chapter "on the application of these modes of treatment to particular cases," we find the following subjects considered at some length—punctures and wounds received during dissection,—bites of animals, &c.—bruised wounds,—ulcers,—and some anomalous cases of local diseases. We will extract the most important observations under these different heads, without taking particular notice of the numerous details of cases by which he has both fortified his opinions and increased the bulk of the volume.

"*Of Punctures, &c.*—In cases of recent punctured wounds, the orifice and surrounding skin should be moistened with a drop of water; the caustic should then be applied within the puncture until a little pain be felt, and then over the surrounding skin, and the eschar must be allowed to dry. In this manner it is astonishing how completely the terrible effects of a punctured wound are prevented; the eschar usually remains adherent, and the case requires no further attention.

"At a later period after the accident, when the caustic has been neglected, some degree of inflammation is usually present, the orifice is nearly closed with the swelling, and a little pus or fluid is formed within. A slight pressure will evacuate this fluid, the caustic may then be applied within the puncture, and over the surrounding skin, beyond the inflammation, and must be allowed to dry. In this manner we frequently succeed in forming an adherent eschar, and all inflammation subsides. Any slight vesication which may be raised around punctured wounds, is not of the same consequence as when an adherent eschar is wished to be formed over a sore or ulcer; one or more small punctures may be made to evacuate the fluid, and the part may be allowed to dry.

"If there is reason to think that an abscess has actually formed under the puncture to any extent, it must be opened freely by a lancet, and treated with caustic and poultice, keeping the poultice moist and cold with water.

"In cases of puncture where the orifice is healed, and where an erysipelatous inflammation is spreading, attended with swelling, I have applied the caustic freely over and beyond the inflamed parts, and I have had the satisfaction to find that the inflammation has been arrested in its progress, and has shortly subsided.

"This mode of treatment is particularly useful in cases of punctured and lacerated wounds from various instruments, such as needles, nails, hooks, bayonets, saws, &c. and in the bites of animals, leech-bites, stings of insects, &c. In considerable lacerations the same objection would exist to this treatment as in large ulcers.

"The dreadful effects of punctures from needles, scratches from

bone, or other injuries received in dissection, are totally prevented by this treatment. I have for the last five years, had frequent opportunities of trying it in these cases, and have the most perfect confidence in its success."

"*On Bruises.*—It has been already observed, that the caustic is an invaluable remedy in cases of bruised wounds of the shin. In these, as in all other cases, the value of this remedy is greatly enhanced by an early application. In bruises on the shin, I have not had a single instance in which I was not enabled to effect a cure by the adherent eschar, if application was made to me early. The difficulty of forming an adherent eschar is always increased by delay; but in these bruises along the shin there is an additional reason for this increased difficulty, arising out of the tendency observed in them, to the formation of a slough.

"In this place I have, indeed, to make an observation of particular interest, both in a pathological and curative point of view; it is, that the formation of this slough has always been prevented by an early application of the caustic, in the cases which have hitherto fallen under my care. This fact may probably admit of explanation in the following manner: the bruise partially destroys the organization of the part, and the subsequent inflammation completing what the injury had partially effected, a loss of vitality takes place, and the slough is formed. The early application of the caustic has already been shown to have the remarkable effect of preventing the inflammation consequent upon certain wounds, and thus the part is suffered to recover from the injury done to its organization, and its vitality is preserved.

"Whether this mode of explaining the fact be correct or no, the fact itself is extremely important, for the formation of a slough, which the early application of the caustic can alone prevent, renders it quite impossible to effect the formation of an adherent eschar.

"When the patient applies too late after the accident to prevent the formation of a slough, we must still treat the case by the caustic. It is to be applied over the bruised and inflamed part. The eschar remains adherent round the part occupied by

the slough, and prevents or moderates the inflammation, and when the slough separates, an eschar is to be formed over the exposed sore.

"In the neglected and severer cases of bruise, attended by much inflammation, it will be found best to treat the part for a day or two by a cold poultice, to give time for the inflammation to subside; otherwise the caustic might induce vesication of the skin, as I have mentioned already, and the eschar could not be adherent."

"*On Ulcers.*—From the preceding observations, it would naturally be concluded that the lunar caustic would afford a remedy for the treatment of ulcers. This conclusion is perfectly just. Yet there are many circumstances which render the mode of treating ulcers by the caustic, efficacious or the contrary.

"In order that the treatment by eschar may be successful, there must be the following conditions in regard to the ulcer: first, the surface occupied by the ulcer must not be too extensive; secondly, it must not be exposed to much motion or friction; and thirdly, it must not be attended by a profuse discharge: for all these circumstances have a direct effect in preventing the formation of an adherent eschar, or of removing it if formed.

"I observe, therefore, that I have not found the mode of treatment by eschar to succeed in large ulcers of the legs. But in small ulcers, and especially in those irritable and painful little ulcers which are so apt to form about the ankle, and occasionally occur near the tendo achillis, and in which Mr. Baynton's plan is inadmissible, the caustic is invaluable; in these cases the cold poultice and lotion should precede the application of the caustic, for a few days, that the irritability and inflammation of the sore and surrounding skin may be first subdued; and after the eschar is formed, the part must be kept exposed to the air, and defended from external injury, by enjoining the patient to wear trousers and to be careful not to disturb the eschar.

"The plan of curing ulcers is exactly what has been described in the treatment by the unadherent eschar. For in these cases the eschar is generally unadherent at first. It is necessary therefore in all cases, except those of very small ulcers, to examine

the eschar, making a small puncture or rather smooth incision in its centre, so as to evacuate the subjacent fluid, if there be any, taking great care not to break down or bruise the eschar so as to leave its inferior surface at all ragged. This operation should be repeated daily until the eschar proves to be quite adherent. And if the ulcer be rather large, rest should be enjoined until the adherent eschar be fully and safely formed, and a dose of saline purgative may be interposed. It must also be particularly borne in mind, that the eschar must be constantly defended by the gold-beater's skin, which must be removed and re-applied at each examination.

"I have here spoken of ulcers upon the legs. But the same observations apply to ulcers on other parts of the body, and these are, in general, far more manageable than the former, and do not require the same rest during the unadherent state of the eschar."

Under the head of "anomalous cases," our author has introduced *whitlow;* and we presume our readers will not be unwilling to receive all the information he can throw upon the subject of this painful and too often mismanaged disease. In the first stage of whitlow, he asserts that the inflammation will be checked and suppuration prevented by rubbing the caustic over the surface.

On the same principle, experienced house-wives often prevent the formation of this disease, by immersing the affected finger in hot water or lye, and blisters have also been resorted to with similar good effects.

When suppuration has taken place, Mr. H. recommends to open the whitlow freely, to apply the caustic thoroughly within the cavity, and then to envelop the part with a cold poultice. By this treatment the pain and irritation are almost immediately removed, after the smart of the caustic has subsided. A second application is seldom necessary. In some cases, however, there is an increase of inflammation in a day or two which requires the caustic to be again applied. When

the inflammation has subsided, the loose cuticle may be removed, and the caustic applied to form an adherent eschar.

He recommends to treat fungous ulcers of the navel in infants, by first exciting the granulations to a level with the skin, and then applying the caustic so as to form the adherent eschar. A piece of gold-beater's skin is particularly necessary in this kind of ulcer, to defend the eschar.

An inflammation of the integuments of the fore part of the knee-joint, which occurs in servant women from scouring floors, stairs, &c. and which is extremely troublesome both to the patient and surgeon, is best managed, according to Mr. H. by applying caustic freely over the whole surface, previously moistened with water, and afterwards by the constant application of cold poultices and lotions. In many other cases of inflammation in which a more than usually active local remedy is required, he thinks the same treatment will also prove advantageous.

In some cases of *tinea capitis*, he has completely succeeded by the use of lunar caustic. In other cases he has failed without being able to account for the difference from any peculiarity of appearance or condition of the disease. The same remark is true of herpes and other cutaneous diseases, which have not yet been investigated by our author.

Mr. H. is not disposed, like some authors, to recommend his favourite remedy in all cases. He thinks it altogether inadmissible in cases of burns, of large, of fungous, and of phagedenic ulcers, of extensive lacerations, &c. at the same time he asserts that it will be found that such cases in the course of their treatment by the ordinary measures, not unfrequently become fit cases for the application of the caustic, with the view of more speedily completing the cure.

In incised wounds, except such as are received in dissection, he does not recommend the caustic.

In erysipelas, especially where vesication is produced, the caustic does injury, as in recent burns.

He has always failed in his attempts to heal scrofulous ulcers by the adherent eschar; but would propose the trial with the caustic and poultice.

In the preface, actuated no doubt by a moderate share of enthusiasm, he insinuates that the investigation of this subject has only been commenced, and that at some future day more glorious triumphs will be awarded to this remedy.

"May not the caustic, for instance, be of greater efficacy, because of greater power and of quicker operation than ordinary blisters, in some internal diseases?

"It is repeatedly stated hereafter, that the application of the lunar caustic is a means, in certain circumstances, of subduing external inflammation. Might it not, on this principle, be of service in the treatment of some of the internal phlegmasiæ?

"It may be observed, that the lunar caustic may be regarded, almost without further trial, as an effectual preventive of those cases of irritative fever which arise from local injuries, and probably of the effects of poisoned wounds in general. I would not, however, in the latter cases, fail to render 'sure doubly sure' by free excision.

"Might not an adherent eschar be easily formed in those cases of compound fracture in which the external wound is of moderate size, so as effectually to exclude the external air and prevent cutaneous inflammation, and, in more respects than one, to reduce the case to the state of a simple fracture? This object, if attained, would be important indeed, and I hope the suggestion will be submitted to the most assiduous and cautious trial.

"I can have no doubt that the use of lunar caustic admits of being still further extended; and, as I intend to pursue the inquiry, I hope at some future period to publish something more worthy of the attention of the medical public. In the mean time, the plans hereafter suggested must not be adopted without that degree of care, attention, and perseverance, which are obviously necessary to render them successful."

After reading the above extracts, our readers will probably conclude that Mr. H. is disposed to give to this remedy its

full share of importance. As for ourselves, we are by no means desirous of diminishing in any respect the credit with which his zeal would invest the caustic. On the contrary, we have found it so eminently serviceable in various other local affections not mentioned by our author, that we conceive he still has before him a fertile subject for investigation. M.

ART. IV.—*An Inquiry concerning that disturbed state of the vital functions usually denominated Constitutional Irritation.* By BENJAMIN TRAVERS, F. R. S. Senior Surgeon to St. Thomas's Hospital, &c. &c. London, 1826.

WE are happy in having it in our power to present our readers with an analysis of a work of considerable magnitude, from the pen of one already so well and so honourably known to the reading part of the profession. We are gratified, also, that our intelligent author has, in the present instance, proposed as a subject of inquiry, a pathological theme of general interest, it being alike important to the surgeon and physician, to the philosophic inquirer and the practical applicant. Indeed we can scarcely conceive of a subject of investigation better adapted to our present state of physiological knowledge than the present. Our care shall be without perverting the sense of our author, so to condense the work that our readers shall possess, in a small compass, its valuable facts and opinions, for we do not believe that even Mr. Travers, in this *Octavian* age, can write a book which may not be trimmed into smaller compass without the excision of any vital part.

Mr. T. in his preface informs us, that for many years, the subject of the present work has particularly occupied his attention, as one by no means clearly understood. "My object, therefore," says he, "in undertaking this inquiry, was to ascertain with more precision the morbid state indicated by the term constitutional irritation, to investigate the causes most commonly productive of that state, the phenomena by which it is manifested, and the laws by which it is governed;

and from the comprehensive view thus obtained, to derive, if possible, some permanent pathological characters, which might serve as a guide to more correct notions of its nature, and more scientific principles for its treatment."

CHAP. I.—*On the influence of constitution in modifying the effects of local injury.*

That principle of health, denominated irritability, is defined to be the susceptibility of appropriate stimulus, which excites every part of a living animal to perform its peculiar function. "This susceptibility," he observes, "is not confined to any particular form of organization, as nerve, muscle, or blood-vessel. It exists in every organ, simple and compound, but not in equal degrees in all, or even in different parts of the same organ. It is not in the ratio of sensibility, nor vascularity, nor muscularity, nor any particular endowment, but according to the importance of the texture or organ to the functions of life. Thus, muscle retains irritability longer than any other texture, and the heart later than any other muscle." The sign of irritability is either sensation or motion, or both. Irritability is essential to the function of those organs by which life is maintained and displayed, and therefore indispensable to life.

Mr. Travers, however, is not one of those who believe that irritability is life, or that life results from certain elementary properties bestowed upon the animal tissues, and which are the source of the vital functions, as the physical properties of what we comparatively call dead matter, give rise to physical phenomena. Our author believes that irritability is a property communicated by the living principle, and not itself that principle. His opinion on this subject is expressed in the following passage:

"As an animal does not, at the instant of death, part with its proper heat and electricity, so neither does it yield its irritability derived from the same vital processes. But irritability or susceptibility of impression and action differs from the former in this, that it is a property peculiar to, and only communicated by, the living principle."

"Of life itself I am satisfied to adopt the words of the most profound, if not the most logical inquirer which our profession has to boast; "Life," says Mr. Hunter, "is a property (principle) we do not understand, we only see the necessary steps leading towards it."

We are sorry that on the very threshold we are compelled to differ from our author in regard to this interesting question. The opinion which Mr. Travers offers, concerning the nature of life, will readily be recognized as that which, modified by peculiar modes of expression, but the same in principle, prevailed exclusively from the time of Hippocrates to that of Haller. The Phusis of the Greeks, the Archeus of Van Helmont, the Anima of Stahl, and the materia vitæ diffusa of Hunter, are essentially the same, viz. an inscrutable immaterial principle, which is the ultimate cause of the whole series of vital phenomena. We are persuaded, however, that the mode of reasoning which thus anticipates the existence of such a principle as the above, is unphilosophical, and by no means analogous to the mode of investigation employed in other departments of natural science. Since the time of Newton, the phenomena of inanimate matter have been ascribed to certain ultimate properties, such as attraction, cohesion, elasticity, &c. &c. nor does any one presume to speculate upon the essential nature of these qualities, nor to resolve them into other or more remote and general causes, unless it be by experimental research. It may yet be ascertained, indeed, that electricity or galvanism bestow these properties, but it would be absurd in the extreme to give a name to an immaterial inconceivable principle, and suppose this to be the source of all the physical phenomena which we observe, and yet we might as well suppose a vitæ diffusa in physics as in physiology. This absurdity is illustrated by the manner in which the older philosophers speculated concerning *nature* as an ultimate cause, as that nature abhorred a vacuum, &c. &c. Such conclusions, it is evident, preclude all further inquiry.

The ultimate vital properties, sensibility and contractility, which Haller, Bichat, and especially Lawrence, have ascribed to the living tissues, correspond to the above physical properties; and the term life, if it be not an empty word, signifies the manifestation of vital phenomena. What is a living system but one which feels, which moves, which circulates its blood, which assimilates, which breathes? It may be more simple, indeed, and exhibit nothing but motion and feeling when irritated. Mr. Travers seems to think that the irritability which remains after decapitation, and which is sometimes observed in the heart, when removed from the body, is not life, nor communicated by the living principle; for he supposes the living principle to be a unit; but if so, how is it that some animals may be cut into many parts, and each exist as a distinct animal? Many of the organs are dead indeed, in the more perfect animals, when breathing and circulation have ceased, nor can life exist long in any of the tissues, because it is here more dependant upon a complex organization; but the contraction which takes place in the muscles is certainly not a physical phenomenon, never occurs in dead matter, and must be a result of vital properties; if not, what is it?

In his second section our author treats of morbid irritability. This results from augmentation, diminution, or perversion of this property. "An excess or deficiency of the natural stimuli, or the operation of noxious agents, will convert healthy into morbid irritability; and a natural stimulus applied to an organ already morbidly irritable, becomes an irritant." An irritable mind is one easily excited by joy, fear, &c., an irritable bladder by its contents, an irritable skin by changes of temperature, diet, &c.

Mr. Travers further defines irritability to be either proper or sympathetic. First, as applied to the system. If the body become deranged through the mind, or vice versa, it is sympathetic. If the irritability of either is singly and directly acted upon, it is proper.

Second, as applied to organs. If fear occasion a desire to pass urine, or worms in the alimentary canal produce temporary blindness, it is sympathetic. Says our author, "the sympathies of health and disease are closely interwoven with this property," (a phrase twisted to some obscurity, by the way.) Every sympathetic action pre-supposes a direct one, though the latter may not be obvious. Our author thinks that we are better acquainted with the partial sympathies than with those of the whole with a part. "Sympathies," he says, "are associations founded on a reciprocity of sensations and actions." He makes the same division of sympathy which has been made by others, into direct, circuitous, contiguous, and continuous.

The irritability of disease is subject to no standard, presenting all the fluctuations which can occur betwixt the extreme states of elevation and depression. The sympathies are therefore often exaggerated and capricious, corresponding to new modes and degrees of irritability.

The mind and the body, in disease, generally sympathize with, and reciprocally influence each other.

The author quotes and approves of Mr. Hunter's definition of an irritable habit, which is "an increased disposition to act without the power to act with."

The same principle which renders a part over irritable, renders it over active, and thus the balance of action is disturbed. A weak organ or constitution is easily disturbed, because often excited to too great activity. A morbidly excessive or deficient action, at first occasional, may become habitual. The system of every individual has some part more weak and less strongly fortified against disease than others. In scrofulous habits the absorbent capillary function is below par, the exhalent in the dropsical, &c. &c.

Every practical physician is acquainted with the different degrees of constitutional irritability, and the different degrees of mischief which result from similar injuries. A whitlow,

a bile, or an inflamed gland, in some individuals, is unnoticed, except as a local affection, while in others they produce the most violent symptomatic fever. The author relates the cases of two gentlemen who each received a slight wound upon the shin. Under the same treatment the one recovered in two or three days, while the other was confined for as many weeks, with a painful inflammation of the absorbents of the limb and glands of the groin, and with an ill-conditioned ulcer. Mr. T. infers from this the importance of consulting the constitution of the patient in regard to applications, as leeches, for instance, to an inflamed part, which sometimes produce great irritation. The same thing is true in regard to vesicatories and escharotics. Very various degrees of constitutional excitement are also produced by comparatively unimportant surgical operations, such as implanting teeth, tying hemorrhoids, &c. A great diversity also occurs in the effects of medicine on the system.

To illustrate the influence of an irritable frame of mind in aggravating the effects of local injuries, our author relates several interesting cases. The first is one of a lady who submitted to the removal of a small tumour from the breast. She had been harassed with the most distressing apprehensions, and made preparation for death. She died the day after the operation.

An extraordinary case is also related of a young woman, who was maliciously warned by a gipsy to beware of her first confinement. The circumstances of her labour were natural, but she survived only a few days, and apparently because of the deep impression which the prediction had made upon her mind.

A young woman happily married had become exceedingly anxious with morbid apprehensions in regard to her first confinement. It was found impossible to allay them, and when the period of her delivery arrived she gave birth, after an easy and safe labour, to a still-born and imperfect child,

and she herself survived but a few hours, although on examination by an eminent anatomist, no morbid læsion whatever was discovered.

The apprehension of surgical operations, when the system is enervated, and disturbed by disease and suffering, has in many instances destroyed life, while preparations were making for the operation. The following case is so remarkable and interesting that we give it entire:

"A man of colour, of middle age, rather above the common stature, robust and apparently in good health, was received into the London Hospital, labouring under a moderate sized aneurism of the femoral artery. An operation was proposed to him, to which he readily assented. On entering the theatre, however, he fainted; some wine and water was given to him, which he distinctly swallowed, and the operation was proceeded in, the artery exposed and the ligature applied, but not tightened. During the operation it was observed that no pulsation could be felt in the tumour, but this was accounted for by the fainting. Before tightening the ligature, it was suggested by the operator to wait until the pulsation was re-established. Some increased attention was then paid to rouse the downcast energies of the patient, and it was remarked that the syncope had continued an unnatural time. After the attempt had been some time persevered in, a more attentive observation proved that he was quite dead. All the usual restorative means were then tried, but without effect. On dissection both sides of the heart was found empty, and the lungs tinged with blood; no other particular appearance was observed."

The same sometimes results from bodily exhaustion, from continued spasm, &c. The author here relates a case in which the patient, having suffered symptoms of hydrophobia for some days, suddenly expired after excision of the bitten part; also a case by Sir Astley Cooper, in which the patient

having suffered much pain for several days, from a thecal abscess in the finger, suddenly expired on having it laid open.

Mr. T. here takes occasion to remark on different modes of living as sources of morbid irritability. Persons in high health, in whom the nutrient powers are perpetually struggling with a surplus of diet and stimulus, are exceedingly liable to constitutional derangement from local and other injuries, hence the artisans of crowded cities are less apt to recover from compound fractures and surgical operations than the more temperate and laborious husbandman. An impure atmosphere, as that of cities, is also a cause which fosters morbid irritability.

In females, the states of pregnancy and lactation give efficacy to morbid causes which disturb the balance of the system. Cases are related illustrating this principle.

A latent disease of a chronic character, as, for instance, of the liver, testicle or kidney, renders the system more susceptible to morbid impressions, and recovery less certain after injuries and operations. A man, who suddenly died after an amputation of the hand, was found on dissection to have tubercles of the lungs in an incipient state.

Gradual reduction of the system by disease or otherwise, is favourable to the result of a capital operation, but it may be lowered so much as to induce other forms of disease, and to exhaust the powers of life.

The effect of injuries, which leave a state of chronic local disease, is to induce inflammatory diseases of other and remote parts, as diseases of the liver and lungs result from injuries of the head.

Continuous inflammation is most frequent in persons who incur injuries and undergo operations in a state of health. Trifling operations under such circumstances have proved fatal, which has induced many practitioners, in such cases, to impose restraint before operations requiring confinement.

CHAP. II.—*On the effects of Local Injury on the Constitution.*

"Irritation is the name given to that state which is produced by an extraordinary excitement of the irritability, either of a part of the system or the whole: irritation is therefore local or constitutional." The phenomena of irritation belong to the nervous system, as those of inflammation do to the vascular, and like these systems they are related. As the causes and degrees of excitement are various, so are the signs and modes of irritation.

The author first treats of *local irritation*, which is demonstrated by: 1. An alteration in the habitual and proper sensation or action of a part. 2. Pain without other signs of inflammation. A carious tooth sometimes occasions a tic douloureux of the dental nerve. Some calculous concretions, which form in the kidney, create severe local pain in those organs without a symptom of inflammation. When irritation is unaccompanied by inflammation, it may be, and often is, remote from the seat of the pain and other signs of disorder by which its existence is known. 3. *Inflammation.*—When local irritation is acute and permanent, inflammation ensues. Local irritation in a high degree may be transferred to the system before inflammation can have occurred, or as a consequence of inflammation.

Local irritation may be said to terminate in resolution in local inflammation, or in constitutional irritation. Of these the last is the most important, and that to which our author particularly directs his attention.

Irritation which from being local has become constitutional is imminently hazardous.

The causes of this form of irritation are: 1. The various forms of injury by mechanical or chemical læsion. 2. Inflammation, the result of local injury. The symptoms which indicate its presence, when unmixed with local or general inflammatory action, differ essentially from such as are set up by inflammation. The nervous system then furnishes the

morbid phenomena. The preternatural actions of the vascular system which generally follow, are proportioned to the strength of the symptoms of irritation.

Local irritation may, by the natural sympathies, compel the system reluctantly to take cognizance of its impression, and when this is the case, general irritation is termed *natural;* but if from a slight and apparently inadequate injury or local irritation of any kind, the system becomes suddenly and spontaneously disturbed, in consequence of the presence of morbid irritability, the irritation is termed *morbid.*

Constitutional irritation is by the author divided into two kinds, *direct* and *reflected;* the first immediately resulting from the local injury alone, the second merely elicited by it from the morbid condition of the system, (by the way we do not see the distinction between this division and the last.) The first is relieved by the removal of the local disease; the second becomes a purely idiopathic disease no longer dependant upon the local affection.

The symptoms characterizing the *direct* kind are, in the nervous system; rigour, delirium, convulsions, coma,—in the vascular, phlegmonous fever, suppurative, ulcerative and gangrenous inflammation.—Those which belong to the *reflected* are, in the nervous system, epilepsy, tetanus in all its modifications and other forms of spasm, mania, &c.—In the vascular system; the fever accompanying scrofulous and carcinomatous inflammation, erysipelas, carbuncle, &c.

The author next considers the influence of contingent circumstances, which are: 1. The texture or organ which is injured. 2. The kind of injury. 3. Its magnitude. 4. The subject of the injury.

It is obvious that the degree of immediate sympathy which the system manifests, must be measured by the degree of vital power and sensibility residing in the injured part.

Thus, an injury of a vascular and nervous part, like the skin, is more readily felt by the system than one of a tendon or cartilage. This, however, is not the criterion, according

to our author, of the degree of general irritation which is to follow, for, in the latter instance, the greatest disturbance finally results, but this, he says, is the result of morbid actions, while the other belongs to the condition of health.

Here it appears to us that our author has already found his distinction not practical. Certainly the symptoms which result from the wound of a tendon or a cartilage, though not so prompt, as necessarily follow and are as natural, as those which more immediately result from a wound of a more nervous and vascular part.

Injuries of the integuments of the head, chest and abdomen, excite severer symptoms of irritation than those of other parts of the common covering of the body or limbs.

Læsions of muscles are severely felt on account of their properties as well as texture. Spasm is often the result, and especially when any detached or extraneous body, as a spicula of bone, acts as an irritant. Tetanus often results from wounds of muscles.

Parts endued with low vital powers, as are the fibrous structures, the tendons, ligaments, fasciæ, &c. when injured, as observed above, create a peculiar train of lingering symptoms.

The adhesive and suppurative inflammation of the medullary membrane and periosteum, resulting from injuries of bones, excites a high degree of constitutional irritation. The injuries of arteries are little felt by the constitution. But veins, because of their approach to the character of fibrous membranes, are susceptible of, and transmit high irritation. The same is true of the absorbents. Nerves, when the subject of injury, occasion serious and alarming symptoms of irritation.

The injuries of organs composed of the primary textures, occasion constitutional irritation proportionate to their importance in the economy.

Much depends also on the nature of the injury; narrow and deep wounds, punctures, &c. are more serious than broad and bold cuts, because they retain the effused fluid, and because

the wounded part is frequently embraced by a tendonous theca, which causes the matter to become diffused, prevents the swelling of the part, and is itself the subject of peculiar irritation. A nerve also may be pricked.

Lacerated and contused wounds, because of the destruction of tone in the part, are, in the skin, attended with erysipelas, in the muscles and tendon, often with tetanus.

The extent of wounds is also an important circumstance. "The magnitude of an injury is felt in two ways; in its immediate and in its secondary effects. Either the system breaks down at once, and the vital functions are staggered by the appalling shock, or, having withstood this, the constitution, with diminished powers, engages in the unequal conflict; erysipelatous or gangrenous inflammation is set up, and it sinks exhausted under the wasting processes which must clear the way for reparation."

Circumstances of age, sex, and condition by which habits are determined, are also to be considered.

A scrofulous diathesis is very often the source of reflected irritation, displayed in the formation of the hectic paroxysm, and in the signs of consentaneous morbid changes in the visceral organs.

CHAP. III.—*Examples of Direct Irritation.*

Causes.—1. Sudden, extreme and unremitting pain, and certain affections of the mind co-operating with bodily disease. 2. Injuries and operations of various kinds. 3. Inflammation, the result of injury, terminating in suppuration or in gangrene. 4. Exhaustion from hemorrhage or colliquative suppuration. 5. Poison; animal, vegetable and mineral.

Bodily pain, when amounting to a certain degree of intensity, is of itself destructive, as exemplified in protracted parturition. The following passage we regard as one of the utmost importance to the general practitioner, and we therefore give it entire:

"There is a case in which, with an unconfined state of the

bowels, abdominal after-pain, aggravated by pressure, augments at no distant period from delivery, to a degree sufficient to induce the belief that puerperal inflammation exists; the pulse is accelerated, and notwithstanding its want of power, and a general expression of feebleness, the practitioner, suspicious of the pain, takes away a full quantity of blood. No satisfactory result is obtained; the pulse and the patient sink together, and a fatal coma succeeds. This is a pain, not of inflammation, but of irritation, and would have a better chance of relief from laudanum than the lancet. A case is quoted from Dr. Merriman's 'Synopsis of the Various Kinds of Difficult Parturition.'"

"Certain forms of mortal injury are productive of sudden excruciating and unremitting pain, such as ruptures of the stomach, gall and urinary bladders. Death ensues in these cases many hours sooner than when the pain is less intense, and before the morbid changes, which take place in consequence of the injury, are so far established as to make it credible that the result is to be ascribed to their influence."

Arsenic and other poisons, taken into the stomach, seem to destroy life by an impression on the nervous system, as indicated by overwhelming pain. The author illustrates the effect of pain on organs remote from its seat by an interesting case. A vigorous young man was thrown into a dungeon at Hayti. Thumb screws were put upon him, and a jug of water placed by his side. The jailer, who came to him occasionally, lifted the pitcher to his mouth, at which times he drank freely; in the intervals his mouth was parched; he was restless, but dozed a little. During forty-eight hours he never felt the least inclination to void either urine or stool. Some hours after the screws had been removed, he passed a moderate quantity of very high coloured urine, after which the secretion gradually returned.

In most instances of death from violent disorganization of texture, little pain is endured, because the shock suspends the sensibility of the system.

Pain, when periodical, as in tic douloureux, can be endured for a long time.

The first effect of intense and unremitting pain, is precipitation of vascular action, the pulse becoming tremulous and irregular, the countenance cadaverous, with stupefaction of the senses.

The author here again takes occasion to speak of the influence of mental despondency as auxiliary to that of morbific causes. A case is related of an elderly lady who reluctantly submitted to an operation, being filled with apprehensions with regard to its result, although her fears were apparently unreasonable. After the operation, there occurred continued prostration of strength and spirits, with feeble pulse and irritable stomach, terminating in death.

The exciting passions of anger and joy have been known to exert the same influence.

Previous insanity is also recorded as a circumstance to be taken into consideration, as regards the influence of irritative causes. Cases are related illustrating the principle.

The author next considers the *nature* of injuries and operations as modifying direct irritation, and commences with relating several cases of burns. The remarkable influence of this species of injury on the nervous system is so often exemplified in the practice of almost every physician, that it is unnecessary that we should present them. The symptoms attending were, feeble pulse, surface of the body cold, irritable stomach, coma, and difficult respiration, in fine, a general prostration of the vital powers.

It is generally true, that in injuries of this description, if the patient survives the third day with amendment, he may be regarded as safe, as, at that time, re-action may be considered as established, though in some instances the patient is subsequently destroyed by sphacelus, or exhausted by the drain of a very extensive suppurating surface.

The cases related by the author are such as present the symptoms above described, of primary irritation, amounting to suspension of re-action. This is the broad line of distinction between the cases of death and recovery. The author thinks that this cause of difference is not generally constitution, be-

cause the robust fare no better than the feeble. One cause undoubtedly is the greater susceptibility of irritation in young persons, who are more liable to injuries of this character. Extent and other local circumstances of the injury have an influence, but it is far from being true that the degree of irritation is proportioned to extent or depth of the injury. The situation of the injury is undoubtedly of greater importance,—burns upon the neck, chest, and abdomen, proving oftener fatal by direct irritation. The nature of the texture (the skin) is a circumstance of moment in the solution of the question, for this organ is concerned in common functions with the kidneys and lungs, which by such injuries must be, in part, suddenly interrupted. It is also the principle seat of tangible impressions, and the involuntary sympathies connected with it by the medium of the brain, necessary to the due execution of the vital functions; regulating circulation, respiration, temperature, secretion, are so numerous that the simple arrest of these sympathies would be sufficient to throw the system into a state of universal tumult. But perhaps the instant conversion of natural into morbid sensations, or irritants, may best explain the fatal shock which such accidents communicate to the brain.

In exterior burns, it is remarkable to how late a period the faculties of the mind are preserved, although benumbed, and as if the patient were stunned by a fall. Fulness of the veins of the brain, and effusion beneath the arachnoid, are found after death, but are too frequently seen in other cases of sudden death to be much dwelt upon. The proximate cause of death appears to be a kind of functional concussion of the nervous system.

The author next treats of *fractures, contusions, lacerations, &c.* as sources of direct irritation, and first relates a case of a gun-shot wound as illustrative of his principles.—Symptoms ensued from the injury very similar to those detailed in the foregoing instances of direct irritation, and the patient expired without any re-action having occurred. No

morbid appearances were discovered, except in the wounded part. A very similar case is also related in which the injury was inflicted by the wheel of a wagon, across the leg and thigh.

Operations for recent injuries are a frequent source of direct constitutional irritation, in illustration of which, a case is related of a stout young man, whose hand was literally mashed to pieces in a carding machine. Amputation was performed at the middle of the fore-arm, but with little apparent suffering. Soon after, he was affected with nausea; looseness, with green stools; pulse quick and indistinct; copious, partial, cold perspiration. These symptoms were gradually aggravated till he expired, about forty-eight hours after the accident. Mr. T. alludes to three other operations performed under similar circumstances, the subjects of which did well.

Another case furnished by Mr. Brodie is related, in which a similar train of symptoms ensued.

A case of compound fracture is subjoined as an instance of "prostration with excitement." It was that of a young stout lad of fourteen, whose leg was jammed by a stick of timber. The integuments were separated from the tibia, which was comminuted above the middle; he was pale and sleepy from a free hemorrhage. The leg was amputated an inch below the tubercle. During the operation he was faint, the pulse extremely quick, and sometimes almost imperceptible. Subsequently he became restless, slightly delirious, and affected with nausea, and with convulsive actions of the muscles. Fourteen hours after the operation the pulse was full, and one hundred and twenty in a minute. Three hours after this, the pulse was increasing in fulness and frequency; skin hot and dry, and there occurred about that time an epileptic convulsion. The pulse then became rapid, breathing quick and laborious. No alvine evacuations occurred, although purges and injections had been given. He soon became comatose; pulse one hundred, and soft; skin moist; constitutional disorder increasing. On the third day after the injury, his

bowels were relieved by the medicine given, and he became more quiet, pulse one hundred and ten and soft; skin, hot and dry; face flushed, tongue white. He passed comparatively a good night, and all symptoms improved. No adhesion of the wound took place, but copious fetid suppuration, and several sloughs were separated; still, however, he continued to improve, and finally recovered.

The author next proceeds to illustrate the influence of operations for chronic diseases, in the production of direct constitutional irritation. The first case which he relates is one of lithotomy, on a child three years old. Although the operation was admirably performed, not occupying more than one minute of time, it was soon followed by a chill, and the natural temperature of the surface was not restored. He dozed, was convulsed, and soon died, much to the surprise of the attending surgeons, who attributed his death to fright. Several other cases are related in which the result was the same, the unfavourable symptoms of chilliness, torpor, &c. occurring an hour after the operation. A similar case is also related, in which the patient was rescued from this state of prostration, by administering gin and ether, diluted with barley-water. In some of the cases related, the parents had been in the practice of administering gin for the relief of pain, and the author here takes occasion to deprecate the practice of wholly abstracting accustomed stimuli, on such occasions. "There is no essential difference, or rather there is a close analogy in the symptoms and general state of these cases, and of the subjects of the severest burns and complicated injuries."

In two of the cases related, the patients died in convulsions caused by cerebral irritation. These spasms arise in opposite states of the system,—in the plethoric and the ex-sanguine—in the robust and the debilitated—in congestion and in effusion—in acute inflammation and in destructive ulceration.—In short, there is an active and passive form of convulsions, and upon the proper treatment of the disease, upon which

they are symptomatic attendants, the understanding of this distinction is of the last importance. In one case we look for relief to cordials and tonics, in another to venesection and purgatives.

We next notice the author's observations on *inflammation* following injuries and operations, as a source of direct constitutional irritation. A man forty years of age was admitted into Guy's Hospital, on the morning of Jan. 1st, 1823, for a superficial collection of matter in the palm, with an excessive inflammatory œdema of the whole hand and fore-arm. He stated that he had bruised the back of his hand with an iron hook five days before, and had since poulticed the part. The original wound was now nearly healed. The abscess was freely opened, and it was again poulticed. In the evening three gangrenous vesicles appeared on the back of the hand; the man was in a state of severe irritation, as was indicated by his countenance and manner. During the night all the symptoms of disorder were aggravated; his restlessness became delirium, and on the next day (the seventh from the injury) which closed his existence, the whole arm was found to be in a state of gangrene.

Another case is related, in which a similar train of symptoms resulted from the prick of a pin. Numerous other cases are related, illustrating the same principle, but as they are such as fall under the observation of every surgeon and physician, it is not necessary that we should transcribe them. "The most important practical indications which these cases convey," says the author, "are: 1st, Early and free venesection to the relief of pain; 2d, Early and free openings of abscesses. If these are overlooked, the effective aid of medicine is questionable; if they are fulfilled, it is capable of affording most essential benefit, both in the stage of excitement and collapse."

"The common error is in relying upon topical blood-letting, till general blood-letting is interdicted. Under a prudent restriction, pain may be taken for a director to the use

of the lancet even in incipient gangrene. It is not the process of mortification which destroys life in these cases; it is the irritation of the nervous system by the inflammation, and the acutely agonizing pain which accompanies it."

We give the abstract of a case designed to illustrate the influence of inflammation after operations.

Haggar, a drayman, æt. forty-four, was admitted into St. Thomas's Hospital at seven o'clock in the evening of the 24th of Nov. 1823, with a compound fracture of his left leg, occasioned by the wheel of his dray having passed over the limb about two hours before. Both bones were broken, and the tibia much comminuted. The muscles also were much wounded, and he had bled freely before his admission. He felt considerable pain in his limb; his countenance was pale and anxious; his manner indicative of extreme distress. His pulse ninety-six and full. At half past three the limb was amputated below the knee, a flap being formed of the integument on the outer side of the leg. The patient was very faint during the operation, but recovered on taking a cordial. After he was put to bed the cordial was once or twice repeated, by which his circulation and warmth were restored; forty drops of laudanum were given in an ounce of camphor mixture.

During the first night he slept but little. At six in the morning he was made restless by spasms of the limb; tongue white and dry; respiration oppressed; pulse one hundred and twenty, full and rather hard.

On the 26th he had slept pretty well; the limb was quiet, pulse one hundred and forty-four, full and quick, but softer; respiration freer. No stool since his admission. Ordered a cathartic. On the 27th had slept well till about one o'clock in the morning, when spasms of the limb occurred, which continued till six, succeeded by heat. At ten o'clock he lost a pint of blood from the wound; symptoms all aggravated. Bowels twice opened.

The limb still affected with spasms. He was now ordered

the effervescing draught, with five minims of the tinct. of opium, every six hours, and four ounces of Port wine in sago in the course of the day.

On the 28th symptoms were all aggravated, with a deep and extended discolouration of the thigh. The stump discharged a purulent sanies. Castor, wine and porter were administered. On the 30th, pulse irregular and one hundred and thirty in a minute, patient nearly insensible, countenance death-like. He died at half past six.

In the fourth section of this chapter, the author treats of hemorrhage and colliquative suppuration, as sources of direct constitutional irritation.

"A hemorrhage which does not prove directly fatal, as from a wounded artery, sometimes leaves the patient in a state of exhaustion so great that he is incapable of sustaining the shock of an operation." A case exemplifying this principle is furnished by the author. The patient received a lacerated wound from the bursting of a gun. A tourniquet had been applied, but it having been accidentally loosened a profuse hemorrhage ensued, which produced a collapse. After two hours, however, his pulse rose, beating sixty in a minute, and neither thready nor intermitting as before; his faculties were perfect; his limbs warm and his complexion much recovered. The operation of amputation was performed with but little loss of blood, and little complaint. He swooned, however, immediately after the operation, and although roused for a time, this state recurred at intervals till the evening of the following day, when he expired.

A considerable loss of blood, either during an operation or consequent upon it, is most commonly attended with serious consequences of another kind. It so prostrates the vital powers as to expose the parts to imminent hazard of erysipelas and gangrene. A case is related of an elderly gentleman who was cut for a deep fistula, in which gangrene supervened from this cause, there having been a very considerable loss of blood. A case of hemorrhoids is also mentioned, in which

excision having been performed, with the loss of a good deal of blood, there occurred erysipelatous inflammation of the mucous membrane of the rectum.

"When the system has been rendered irritable, but is recovering, either from hemorrhage, or from an injury, or inflammation unattended by hemorrhage, a secondary hemorrhage, even though it be inconsiderable, often extinguishes life." "Debility," says the author, "is the basis of morbid irritation, and those causes of debility which operate with the greatest force, most invariably aggravate the state of irritation." He thinks it very questionable, however, whether, in cases of this description, stimulants in any considerable quantity is not more injurious than beneficial. *Excitement, when there is no power to act, only exhausts the vital powers.* Hence it has been a good turn of fortune for many persons to have been left for dead on the field of battle. Sleep will restore, where alcohol destroys.

The above remarks are certainly very rational, and highly important as a practical precept. We have no doubt that, not only in cases of the above character, in which exhaustion is induced by hemorrhage, but in many cases of fevers and other affections in which the powers of life are depressed and struggling against disease, which can not be immediately removed, the use of stimuli, as employed by some, is productive of infinite mischief, in exhausting the excitability which nature is husbanding against the crisis of the disease.

A rapid and excessive suppuration is among the causes of direct irritation, mentioned by our author. This may arise from the excess of the secretion alone, or from the situation of the secreted fluid, as when confined within a theca or fascia.

Gurton, a robust man, was admitted into St. Thomas's Hospital, May 30, 1823. He had merely rubbed a piece of skin from the back of his hand, which injury had excited inflammation. Poultices had been applied, and an incision made above the wrist, but matter had not then formed. The arm

was excessively swollen, red, tense, and with vesications on the fore-arm; pulse full and quick; tongue white; bowels confined. Prescribed poppy poultice, a cathartic of calomel and colocynth, and an anodyne to be taken at night. June 1st, a small portion of the integuments above the elbow sphacelating, symptoms improved. On the 2d, erysipelatous inflammation appeared upon the side and upper part of the back. He was now taking a grain of opium once in six hours. A pint of porter was added, to be taken daily. June 4th, a large portion of the integuments of the upper arm sphacelated, pulse quick, skin dry. Treatment, bark, anodyne pills, and Port wine. On the 10th, a fluctuation was felt below the elbow. A puncture was made, and twelve ounces of matter escaped; 13th, discharge copious; 17th, discharge still profuse, but health improved; countenance cheerful; good appetite; rests well. Symptoms improved till the 7th of July, when there occurred loss of appetite; pulse small and frequent; tongue coated; arm looking white and glazed; discharge less and thin. On the 14th, he was in all respects worse; thought to be too feeble to endure an amputation; 16th, died.

Other cases of similar import are also related, and it is remarked by the author, that, at a certain period subsequent to the primary disturbance of the system, all were in a condition of tranquillity approaching to convalescence.

The last class of causes mentioned by the author, as sources of direct constitutional irritation, are poisons, from the animal, vegetable, and mineral kingdoms; principally, however, the first, and especially those communicated by wounds received in dissection.

Our author briefly discusses the question of the absorption into the system of putrid animal matters. Some have asserted that punctures and cuts received in dissection are no more frequently attended with fatal results, than ordinary wounds of the same form, which are followed with malignant symptoms, when there prevails an irritable diathesis favouring such a result. It is now, however, generally conceded that,

although a predisposing morbid irritability may often favour the disease, the train of symptoms which ensue are those of morbid animal poisons introduced into the system. Perhaps it is a sufficient proof of this principle, that in simple punctures, with clean instruments, the mischief which follows is consequent on inflammation; but in the cases under consideration, but very little local inflammation is noticed, and the direct constitutional irritation is first observed. An interesting case is recorded, which rests on the authority of Sir A. Cooper.

"Mr. Elcock, student of anatomy, slightly punctured his finger in opening the body of a hospital patient, recently dead, about twelve o'clock at noon; and in the evening of the same day, finding the wound painful, showed it to Mr. Cooper, by whom he was referred to Dr. Haighton, in whose house Mr. E. at that time resided. During the night the pain increased to extremity, and symptoms of high constitutional irritation presented themselves on the ensuing morning. No trace of inflammation, however, was apparent, beyond a slight redness of the spot at which the wound had been inflicted. In the evening he was visited by Dr. Babington, in conjunction with Dr. Haighton and Mr. Cooper. Still no local change was to be discovered, but the nervous system was agitated in a most violent and alarming degree, the symptoms nearly resembling the universal excitation of hydrophobia; and in this state he expired at three o'clock on Wednesday morning, within the short period of forty hours from the injury."

The author here takes occasion to class the inflammations of the limbs from injury. They are: 1st, of the absorbents and glands; 2d, of the veins; 3d, of the cellular membrane; 4th, of the thecal of tendons, and fascial muscles. These, however, are liable to become complicated, by the occasional termination of absorbent venous, or thecal inflammation in diffused abscess, or gangrene of the cellular membrane, and the above organs also sometimes partake of the inflammation

of the cellular tissue. Inflammation of the absorbents is at first seldom accompanied by inflammation of the cellular membrane, except of that in which the vessels lies; the swelling is inconsiderable, the blush is confined to the raised, swollen, and cord-like absorbent lines, as is the chief pain. From the wounded finger or hand, a sensation of heavy pulsatile pain shoots upward along the arm, and the absorbents are conspicuous from the base of one or more of the fingers, upon the dorsum of the hand and wrist, along the radial or ulnar side of the fore-arm, to the bend of the elbow, and from thence to the axilla.

The termination of this inflammation, if unreduced, is in circumscribed abscess of the lymphatic glands, and the connecting tissue.

"*Inflammation of the Veins.*—This disease is rare, and generally arises from venesection, viz. by the employment of a foul lancet, or an unfavourable predisposition of the constitution. The moderate swelling, but great tension of the limb, and cordy hardness of the vein traceable towards the axilla—the insupportable pain, sense of weight, and immobility, with a festered or oozing state of the orifice, are local characteristics; but the extreme constitutional excitement, morbid vigilance, mental irritability, and despondency, partaking more of the nervous than the simple inflammatory type, and running rapidly from delirium to exhaustion, is peculiar. The blood drawn is strongly cupped, and buffy. The pulse rapid and stringy, becomes more full and soft after copious depletion, but the pain is only partially relieved. The inflammation is slow in affecting the surrounding texture; it terminates in a free purulent discharge from the ulcerated orifice, and in one or more abscesses, in the course or vicinity of the vessels. The disease, if overcome, leaves a state of extreme debility, and hardness and stiffness of the limb. The diagnosis between this and cellular or fascial inflammation, which much more frequently follows venesection, is not difficult to those who have witnessed both and compared them."

The next kind is that of the cellular membrane, and first the phlegmonous:

"*Inflammation of the cellular membrane.*—Many diminutive injuries, such as the wound in blood-letting, punctures, cuts, and abrasions of the fingers, exasperated by neglect of ordinary precautions, excessive use of the limb, or casual intemperance, give origin to the local and contiguous inflammation and suppuration of this texture. It is especially frequent in the palm or on the back of the hand, in injuries of the fingers. It is attended with conspicuous but ill-defined swelling, throbbing pain, and more or less sympathetic inflammatory fever. If the distension be not relieved by an early and free opening, and other suitable treatment, the limb partakes of the inflammation, which extends along the fascia and subfascial cellular membrane. Thus, owing to extreme distention, and to that alone, instead of one or two proper, i. e. circumscribed abscesses, the entire limb becomes a diffused abscess, or nest of abscesses, eventually followed by a corresponding loss of substance from sloughing of the spoiled membrane. The sequel involves a two-fold danger; 1st, that of diffused gangrene; 2nd, that of destructive suppuration. See as an example of the first, the case of Mosely, page 146. Of the second, Gurton, page 189.

"Another inflammation from wounds passes over, or very slightly touches, the absorbents and the entire extremity, and shows itself in a slight fulness and tenderness to the touch, of the neck, subclavian, humeral, and pectoral regions. The axilla is generally also a little full and tender. The inflammation spreads backwards over the scapular region, and downwards and backwards by the serratus and latissimus dorsi. Some time subsequent to the feeling of tenderness, an erythematous blush appears, of a pink hue, irregular in its outline, but abruptly defined. If the finger is placed within the disc of colour, it gives acute pain, so that the patient convulsively shrinks, while beyond this, pressure gives no pain. After a day or two, the part loses its vivid efflorescence, and becomes less exquisitely sensible; but the appearance of fulness rather increases, and the sensation to the touch is that of a very obscure or diffused fluctua-

tion, as if the cellular membrane was broken up, a doughy or quaggy feel. If punctured, a serous fluid only escapes. If the patient survives a fortnight, this becomes purulent; in short, it is a diffused cellular suppuration. It should be mentioned, that in some, if not in most cases, the superficial absorbents of the arm are very slightly inflamed for a day or two before the pectoral blush appears; but the inflammation is trifling and evanescent. The pectoral region is often swollen, and the seat of pain for a day or two before it, is reddened, as on the second or third day from the injury. In this variety of inflammation, the wound is sometimes the centre of a vesicle or pustule, sometimes of a cellular abscess, and more frequently is little, if at all, inflamed.

"This is the serous or erythematous inflammation of the cellular tissue—not by continuity, for I have stated that the arm either escapes, or is so slightly and transiently affected as to excite little notice,—but, as I believe, by the specific irritation of a poison conveyed by the wound into the circulation. Whether it passes from the wound by the veins, the deep-seated, or the superficial absorbents, I cannot take upon me to say; but it does not appear by any manifest sign, that, in either case, the vessel is inflamed by its contents. The tendency of this inflammation, in its severest form, is to excite."

It terminates in, "1st. A serous or lympathetic effusion into the cells of the subcutaneous membrane, and an early disorganization of this texture.

"2ndly. In its milder and less fatal form, a weakly and diffused suppuration throughout the same substance, unpreceded, as in the formation of proper abscess, by any adhesive action.

"The constitution, in the severer form described, is affected in a very peculiar manner and degree; in the milder, it is subjected to an irregular and protracted hectic fever."

"Phlegmonous inflammation terminating, or, I should rather say, permitted to terminate in erysipelas or gangrene, is a thing totally distinct from erysipelatous or gangrenous inflammation, sui generis, as these are also distinct; though erysipelas may, and often does, pass into gangrene. The erysipelatous, more than any other inflammation following injuries, connects itself with peculiar states of constitution, and gives the impression

from the seeming inadequacy of the exciting cause, and the sudden, rapid, and destructive character of the disease, of its originating from some specific irritation. It in fact occurs most frequently in persons of lax fibre, or of broken constitution enfeebled by age or by intemperance."

"*Gangrenous inflammation of the cellular tissue.*—This occurs chiefly as a direct termination of inflammation in the severest and most extensive injuries. I have instanced it under the denomination of 'disorganizing inflammation' in some of the preceding cases of compound fracture. The discoloration and sanio-purulent œdema of the cellular membrane are ushered in by acute pain; the livid cuticle is separated in bladders containing a thin dark sanies; and the surrounding soft parts, without exception of texture, become black, disorganized, and putrescent. With these appearances a rapid and small, or thready pulse, which soon becomes intermittent or faltering, a tongue, mouth, and lips encrusted with a thick brown sordes, a relaxed and sodden skin, hiccough, tremor, and subsultus, a heavy and vacant expression of face, anxiety, low delirium, and stupor—are the constitutional signs in connexion.

"*Inflammation of the fibrous membranes.*—This, the case of acute paronychia, is frequently accompanied with absorbent inflammation, but not invariably, nor is it on this account more serious. Matter is secreted by the inflamed synovial surface of the tendinous sheath, or the particular fascia investing the tendinous extremity of a muscle of the arm or leg: or beneath a ligamentous expansion, as the palmar or plantar aponeurosis. Sometimes the symptoms supervene in a few hours after the injury, sometimes not for days, so that the patient scarcely recognises the injury, usually a small penetrating wound. If the wounded thumb or finger is disfigured by excessive œdema, the symptoms of disturbance are less severe than when with great tension the swelling is inconsiderable, and void of fluctuation, so as to make the existence of matter doubtful. The quantity of pus is so small, and the relief of discharging it so great, as to demonstrate that its situation alone had given rise to the intense pain, and extreme constitutional disorder. Is it owing to the partial escape of matter into the cellular substance, or to the in-

flammation having originally attacked this texture exterior to the theca or fascia, and affected the interior only by sympathetic connexion, that the symptoms are less urgent when the œdema is present? Certain it is that the incision of the theca or fascia is necessary to the relief of the symptoms, and this must not be delayed, even though the external signs are obscure. When but a flake of matter has escaped, nay when blood only has issued, I have often witnessed as complete a subsidence of the pain and alarm of the nervous system, as when it has been discharged in quantity. This looks more like a relief of tension than of distension.

"The inflammation of the general investing fascia of a limb is not attended by any corresponding severity of constitutional suffering, yet it is often considerable. An inflammation following venesection, which continues slowly increasing for a considerable period subsequent to the operation, yet clearly commencing from that time—marked by a stiff and swollen elbow, and an extensively diffused blush over a part of the upper, and the whole fore-arm, attended with exquisite tenderness to the touch, and pain shooting to the points of the fingers—is productive of much constitutional harass, and generally leaves a permanent immobility of the joint.

"The presence of matter beneath the periosteum, when the bone is sound, as when produced by acute periostitis from injury, is capable of producing the most urgent constitutional distress. I have seen it accompanied by fierce delirium, which ended in complete stupor of two days' continuance, and that in death."

The author relates numerous and interesting cases of the fatal effects of animal poison introduced into the system by dissection. One of these has already been transcribed by us. It is not necessary that we should occupy our pages with others, as they are of a pretty uniform character, and as the subject has been heretofore noticed in this journal.

Two important inferences drawn from some of the cases related are the following:

"1st. That any local irritation sufficed to produce in any part of the body the characteristic sign of the prevailing morbid action.

"2d. That this was independent both of contiguous and continuous sympathy, and pervaded the whole system without reference to any particular track or channel."

"Rigor, nausea, and retching, abdominal tension, restlessness, and depression of spirits, with a rapid and feeble pulse, coated tongue, pinched countenance, partial perspirations, and at length, delirium, followed by stupor and laborious breathing, and terminating existence in the space of ten days, are all legitimate signs of high constitutional irritation, peculiar to no individual form of local injury. But when we find, superadded to these, and seeming to hurry on their career, acute pain and swelling, occupying, within a very few hours, that region of the body which connects the trunk with an injured extremity, the supervention of erythema to the extended swelling of the integument, and the subsequent threatening of diffused suppurations—it is impossible to resist the strong evidence of analogy which such symptoms bear to those which attend upon injuries having a similar origin, and upon those only. But the vesicle furnishes at once the most curious and convincing proof of poison. The pustule of small pox, and the vesicle of cow-pox formed upon the wound, are not more conclusive of the inoculation of their fluids respectively than was the vesicle, in this case, of the insertion of its proper virus."

The author discusses the question, whether any specific contagious disease be capable of being communicated after death, as erysipelas, small-pox, or lues, and decides in the negative, as appears from the following passage:

"Bodies used for dissection are, with a few exceptions, in a morbid condition, and although I have known instances of wounds received in the dissection of poxed and cancerous subjects in the stage of ulceration, I never knew nor heard of a case in which venereal or carcinomatous symptoms succeeded to such casualties. If the simple morbid secretions of living bodies were capable of

acting as poisons, surgeons would be occasionally subject to peculiar diseases from this source, as well as from dissection; and if the morbid poisons were transferable as such from the dead to the living, the fact could not have escaped observation."

On the pathological relation between the cases of simple and poisoned wounds, Mr. T. has the following:

"The occasional approximation of the constitutional symptoms in the two classes of cases, naturally leads to the belief that there is nothing in the nature of the malady which puts it beyond the pale of medical treatment in one case more than in the other. The difference amounts to this, that the poison is in one case the irritant, in the other the inflammation. In either case the local action may constitute so much of the disease as to demand vigilant treatment; but in the former, the disorder arises from the admission of the poison into the circulation, and in most instances the local action is insignificant, except as it demonstrates the existence and activity of the poison. To take up the local disease in this case as especially important, is to begin at the wrong end. The terms 'poison' and 'specific,' have been somehow supposed to convey a mysterious import of incurableness, and we are apt to conclude that our labour is vain, and to yield the contest in despair, when conclusive evidence of absorption is at hand. Nothing can be more contrary to reason than this impression. If a common pathological character, viz. that of over-excitement of the nervous system, be established, the constitutional treatment of the cases will be similar. The difference in rapidity of development, in vehemence of action, must be met by a corresponding activity of treatment. If the pain anticipate other signs of inflammation, if the excitement be so intense, and the depression of the nervous system follow so close upon the stage of excitement, as either to diguise the former, or abridge it of its ordinary limit, we must not suffer ourselves to be betrayed into a hypothetical belief, that the operation of the poison contra-indicates the employment of those measures which have been found efficacious in proportion as they have been early resorted to, in cases to which these

bear a strong and obvious analogy. We know that the effects of powerful poisons, that are not directly subversive of the organization necessary to life, may be overcome, that in many cases in which their agency upon the system has been developed it has been neutralized; that is by the extraordinary operation of common principles that they destroy. There is nothing in the nature of the irritation induced by specific agents, as the saliva of the poisonous snake or the rabid dog, which warrants a belief that it resists the operations of remedies, provided the activity of the poison be not such as cuts off opportunity, by a sudden arrest of the functions of life. It stands, in fact, on the same ground as irritation from other and simple causes, as from mechanical injury. If from the moment of the shock, re-action fail, the injury is in its nature fatal from the complete paralysis of the nervous system; but where this is not the case, as in many instances of direct irritation it is not, and in those of reflected irritation it cannot be, we are as little entitled to conclude that a disease is in its nature incurable, as that it is so, beause we are not in possession of a remedy.

"Mr. Brodie, in a beautiful experiment, demonstrated the recoverableness of life from the destructive action of poisons, by the power of maintaining it until the proper effects of the poison ceased; and cases are well authenticated of human recovery from the sedative influence to the last extremity of noxious gases and deleterious substances admitted into the circulation, both by the stomach and the veins. The well known experiment of Bichat, which many years ago, with the rest of his experiments, I repeated, showing the baneful effect of an injection of venous blood into the carotid arteries, and its removal by the injection of arterial even after a repeated injection of the venous, which otherwise proved invariably fatal, affords a striking illustration of the same fact. But the effect of very gentle alteratives, as they might be termed, of the cerebral circulation, to preserve life when trembling in the balance, in the extreme states of excitement and depression, is continually seen in practice."

Chapters fifth and sixth, the one on the theory of irritation, the other on the pathology and treatment, yet remain, but

we have not room to do them and our readers justice in the present number. We shall therefore resume the subject in our next.

ART. IV.—*A Practical Dissertation on the means of obviating and treating the varieties of Costiveness, which occur at different periods of life, and in cases of predispositions to various constitutional maladies, in peculiar temperaments of Body, in disorders of the Lungs, Stomach, Liver, Rectum, &c. and during Pregnancy, by Medicine, Diet, &c.* By RICHARD REECE, M. D. Fellow of the Royal College of Surgeons, &c. &c. London, 1826.

THE subjects treated of in this work are highly interesting, and deserve well to be made the object of a separate treatise. The sympathetic connexions which subsist between almost every part of the living system and the alimentary canal, are so extensive and intimate that scarcely any deviation from a natural or healthy state can take place in the latter without giving rise to morbid actions in various other parts of the system.

Costiveness,, though not in general an affection which is at once attended by prominent and alarming symptoms, is nevertheless frequently the cause of slow, but serious changes from health to disease—of organic affections—and of incurable general maladies. Even the energies of the mind—the temper and the passions, are powerfully influenced by that condition of the intestinal tube which produces; and those circumstances which attended constipation. The subject; therefore, is one of great importance, and we are glad that our author has given us this opportunity of bringing it before our readers. We cannot, however, bestow very great praise on the author of this work, for the manner and ability with which he has performed his task. We do not like the temper with which he speaks of the sentiments of many of the most eminent practitioners of the day, nor do we think that in relation to his own judgment and abilities, he betrays

that modesty which we usually find connected with true merit.

Chapter I. *Of Costiveness.*—The author observes that in all cases of disease attended with a very confined state of the bowels, it is of much importance to ascertain whether the patient is habitually subject to constipation or otherwise. For in persons who are constitutionally subject to a confined state of the bowels, much more debility is produced by the operation of an active cathartic, than in such as have one or two alvine evacuations daily. This fact has been mentioned by other writers, and accords, indeed, fully with our own observations. Although costiveness very frequently produces unpleasant, and often alarming symptoms, yet it does not necessarily constitute a state of disease; for many persons have not more than two or three stools a week, and yet enjoy a good state of health. The injurious consequences of constipation, says the author, are more apt to occur at particular periods of life than at others. In females about the age of fourteen or fifteen, constipation, when it is suffered to continue, is apt to produce retention of the menses, which, in its turn, gives rise to a determination to the lungs, and finally incurable organic disease. Excessive costiveness in females about the period of the cessation of the menses has a tendency, by determining the blood to the brain, to produce apoplexy; or if the determination occurs to the lungs, consumption, or a deposit in the substance of the uterus, which will lay the foundation of the most distressing disease to which the female is liable. Apoplexy is a frequent consequence of a torpid and loaded state of the bowels in persons advanced beyond the fiftieth year of age. At these periods of life, therefore, it is more particularly necessary to keep up a regular action of the bowels. "But this is not solely to be accomplished by purgatives. Remedies that are capable of invigorating the circulation in the abdominal viscera, must be employed along with aperients; such as stimulating stomachic medicines, friction over the bowels, flannel next the skin,

horse exercise, dancing," and such other internal stimulating medicines which increase the irritability of the muscular coat of the intestinal canal; to which may be added electricity and galvanism.

The author observes, not very elegantly, nor we think, very truly, that "the person must be *little better than an idiot* who can contrive, by means of the great variety of aperient articles we possess, to obviate a degree of costiveness which in his constitution is clearly inimical to health." Now we have seen persons who were perfectly *sane*, but who nevertheless did not succeed in their endeavours to obviate an injurious torpor of the bowels by all the articles which they and their advisers could suggest.

Chapter II. *Treatment of Constitutional Costiveness.* In persons from the age of ten to thirty, *powerful* purgatives must be avoided in the removal of constitutional costiveness. This we believe to be a good rule at all periods of life. The means should be mild. Powerful purgatives tend rather to increase than to diminish habitual torpor. In general, the most obstinately costive habit may be overcome by the use of certain articles of diet possessing gently aperient powers; and by avoiding such as have a constipating effect. Ripe fruits, either crude, boiled, or baked,—such as apples, plums, figs, gooseberries, currants, mulberries, are good aperient articles of diet. "The stem of the rheubarb plant, when baked, (without pastry,) is also a good aperient article of diet." To promote the opening effects of these and other articles, from fifteen to twenty grains of carbonate of soda, dissolved in a tumbler of water, should be taken a few hours after a meal.

Green vegetables also, (boiled,) form proper articles of diet for persons of a costive habit. But all jellies, whether animal or vegetable, pastry, mealy potatoes, biscuits, and astringent drinks, such as Port wine, &c. are improper. For common drink, water is the best; cheese-whey will also answer well. The diet should be chiefly vegetable; and when meat is used it ought to be taken "underdone, so as to contain the

red-gravy." The food should be well masticated before it is swallowed. This is an important direction, and ought never to be neglected. Condiments, such as mustard, black-pepper, salt, &c. are useful. *Brown** bread is preferable to the white.

Riding on horseback and walking are useful auxiliaries to diet; but gestation in a coach with easy springs, has an injurious effect.

Along with an appropriate diet, however, there is nothing which contributes more to the restoration of a regular action of the bowels, than a daily attempt, at a particular hour, to evacuate fæces. The patient should persist in these attempts, for at least half an hour at each time; and by persevering in this practice some weeks, the bowels will often be brought to the habit of regular and daily discharges. We have known some patients to continue these periodical efforts for several weeks before the bowels began to act. Soon after breakfast, is, perhaps, the best time to make these efforts.

If the preceding means should not be sufficient to restore due activity to the bowels, recourse must be had to mild aperients. Our author objects to the saline cathartics. They hurry off, he says, the contents of the stomach and small intestines, and do not act sufficiently on the colon; "the conse-

---

* The author gives the following directions for making this "valuable article of diet." He obtained the receipt from Henry Forbes, Esq.

"To four pounds of the best household flour add two table-spoonsful of yest, and half a pint of warm water; let them stand two hours in a warm place, about four feet from the fire; then add half a pound of bran and a tea-spoonful of salt, and proceed to make the dough with skim-milk or warm water; then cover it up as before, and let it stand one hour more; then begin to heat the oven, which will require one hour. Make the loaves, and put them into warm dishes, and let them stand twenty minutes before they are put into the oven. This size loaf will require an hour to bake. When taken out, turn the bottom upwards. The following morning it will be fit for use. By means of this bread, it appears, by a communication in the Gazette of Health, Mr. Forbes, who had been subject to obstinate costiveness for many years, brought his bowels into a regular state; and after being a great invalid, became a robust, healthy subject."

quences of which are, when these purgatives are taken immediately after meal, the evacuations contain undigested food, and when taken two hours after a meal, even chyme and chyle, without much fæcal matter." Another objection to saline purgatives is, says the author, to "reduce the temperature of the stomach and bowels, so as to diminish the transmission of blood through them, and increase its determination to the head." He considers the following purgative as well adapted for the removal of habitual costiveness.

R. Alcaline extract of jalap, 1 drachm,
Oil of caraway, 20 drops,
Mix and divide the mass into twenty pills.

One, two, or three of these pills may be taken every or every other night, "according to their aperient effects; *i. e.* if the bowels have been accustomed to one evacuation in the course of a week, the dose should be regulated so as to produce one every fourth or fifth day; and after this state has continued about three weeks or a month, it should be increased so as to produce an evacuation every third day, and in this manner the person may go on till he has got his bowels into a proper, regular state of one evacuation every or every other day, as he may find best to agree with his constitution.

If with these pills, and a regulated diet, the bowels cannot be brought to act, large but mildly stimulating injections should be forced into the colon. The warm bath, also, will often be found a useful auxiliary; "and the object being to stimulate the intestinal canal, the degree of heat should exceed the temperature of the abdominal viscera, which is from ninety-eight to one hundred." In leucophlegmatic or chlorotic subjects, the temperature of the bath may be gradually increased, while the patient is in it, from ninety-six to one hundred and eight or one hundred and twelve. The latter temperature cannot, however, be employed with safety, by persons of an inflammatory habit.

"If the foregoing treatment should not succeed in conquering the disposition in the intestines to costiveness, we may attribute

its obstinacy to preternatural rigidity of fibre; in which case an anodyne will promote the operation of an aperient medicine, the laxative diet, &c., by diminishing the rigidity of the intestines, &c. For this purpose, four grains of the extract of henbane may be given at bed-time, or twice a-day; and to promote its operation, the warm bath (at a relaxing heat, about 95 to 96,) should be employed three times a-week. The extract of henbane, the tincture of colchicum seeds, and the inspissated juice of the wild cucumber, termed elaterium, are proper antispasmodic purgatives in cases of costiveness, attended with rigidity. Opium, and other vegetable narcotics, are more efficacious in removing preternatural rigidity; but by lessening, also, the power of the muscular coat of the intestine, on which their peristaltic motion depends, they occasion costiveness. In looseness, and even in inflammation of the intestine, opium, by allaying morbid excitement, and diminishing the irritability of the muscular coat, is, when judiciously administered, a most valuable remedy."

But if all the foregoing means should fail to produce the desired effect, one, two, or three of the following pills, says the author, may be administered every or every other day:

R.	Croton oil,	10 drops,
	Castile soap,	2 scruples.
	Alcaline extract of jalap,	1 drachm,
	Oil of caraway,	12 drops.

The author has forgot to tell us into how many pills this is to be made. We presume about thirty would be the proper number.

To aloes he objects, on account of its tendency to favour the production of piles. Castor-oil is also objectionable; for unless it be digested in the stomach, he says, "it will become so acrid in the small intestines as to produce liquid motions, which, like those of salts, will pass over hardened fæces in the colon." We doubt the correctness of this observation; we do not believe that the oil will become *acrid* in the small intestines,—the assertion appears to us wholly gratuitous. The author in the next place proceeds to the consideration of the

treatment proper in cases of costiveness depending upon appreciable or manifest causes; such as sedentary habits,—intense application of mind,—debility, &c.

CHAPTER III. *Costiveness of the Sedentary and Studious.*—in cases of costiveness arising from inactivity of body, or from protracted and intense application of mind, we have, says the author, two indications to fulfil, viz. "to keep up the digestive powers of the stomach, and to increase the peristaltic motion of the intestines." For the latter purpose, he recommends the following pills:

R. Extract of fumitory—alkaline extract of jalap—and extract of rhubarb, of each one drachm. Mix and divide into 30 pills; two or three of these pills may be taken twice or thrice a-day.

As the disease, however, depends on inactivity of body, regular exercise becomes a *sine que non* in its treatment. Exercise on horseback should be taken every morning.

"The studious should occasionally indulge in amusements of an active kind. The game of billiards will agreeably exercise both the body and mind. The shower-bath, too, is an important auxiliary, and sometimes proves a remedy for costiveness, occasioned by an inactive life, or close engagement of the mind."

CHAPTER IV. *Costiveness of Elderly People, and from Debility.*—Glysters of the infusion of horse-radish, administered about twice a-week, will frequently produce very good effects in costiveness from debility. Dr. Blount, physician to the Hertford Infirmary, has used the following composition in similar cases, with excellent effect.

R. Gum guaiacum, ½ drachm,
Hepatic aloes, 1 do.
Subcarbonate of iron, 1 scruple,
Mix and divide into thirty pills.

From two to three to be taken twice or thrice a-day, with a glass of chamomile tea. The compound decoction of aloes

is always an excellent remedy in costiveness from debility. The cause of this variety of constipation lies chiefly in the rectum; and hence, aperient medicines taken into the stomach are seldom sufficient to remove the affection without the aid of stimulating clysters. When the patient is subject to piles, however, *stimulating* injections must be cautiously employed. In such cases warm water will answer best.

As a tonic to invigorate the digestive powers of the stomach after the bowels have been sufficiently relieved, our author recommends the following aromatic tincture of bark. This, he says, he has uniformly found not only to act pleasantly on the stomach of debilitated invalids, but to invigorate the system, and bring the whole vital powers into action. "This tincture is made by dissolving the essential salt of bark in the distilled spirit of buchu leaves and Peruvian balsam with ammonia." The dose of this preparation is from two to three tea-spoonsful two or three times a day, in a wine-glass full of water. Galvanism has succeeded in obstinate costiveness from debility. The fluid must be passed through the spinal marrow.

Chapter V. *Costiveness of Females at the age of puberty, or during the Retention of the Uterine Secretion.*—In relation to the retention of the menses, the author makes the following judicious observations:

"The period of puberty in females varying from the age of fourteen to eighteen, and in some to twenty-one, the suspension of the uterine secretion even at the age of twenty-two or twenty-four, is not to be considered as a case of *morbid* retention, unless the constitution evidently suffers from want of it. If a female, at the age of from fifteen to twenty-two years, with appearances of maturity of body and mind, becomes affected with irregular circulation of the blood, sometimes taking place in excess to the head, occasioning headach, confusion of mind, depression of spirits, loss of appetite, &c.—or to the lungs, &c. producing difficulty of breathing, cough, palpitation of the heart;—there can be no doubt that the general health is suffering from the uterus not performing its

monthly office, and, if the bowels be in a costive state, that the retention arises from a want of a proper determination of blood to it; and if means be not adopted to invigorate the nerve of the abdominal viscera, so as to promote the circulation through them, and direct it to the uterus, irreparable organic mischief will probably take place either in the chest or brain, a very common sequel in scrofulous subjects."

In cases of this kind the digestive organs are generally disordered, and considerable torpor of the bowels exists. It is of much consequence in such instances, to promote the circulation in the abdominal viscera, and to increase the peristaltic action of the intestines. To accomplish both these purposes, our author recommends the following composition:

R. Extract of fumitory,
Extract of aloes, of each 1 drachm,
Subcarbonate of iron,
Subcarbonate of soda, of each ½ scruple,
Essential oil of savin, 20 drops,
Mix and divide into forty pills.

One, two, or three to be taken two or three times a day, so as to produce one alvine evacuation daily. He speaks well also of *savine* in combination with the compound extract of colocynth and aloes in retention of menses, accompanied with constipation, and a loaded state of the bowels. That, in cases of this kind, these, and similar emmenagogue purgatives may often be very usefully employed, we know from considerable experience.

"If, after improving the general health," says the author, "and keeping up a regular state of the bowels by the pills, the uterus should remain indolent, it will be proper to have recourse to a medicine which will act more immediately on it. With this view, four grains of blue pill may be administered every other night for a fortnight, which very rarely fail to produce the desired effect in the course of a month. If, however, the secretion should not take place in the course of a fortnight

after the blue pills are discontinued, the uterus may be stimulated once a day, by passing through its region a gentle electric shock."

In relation to the injection of spirits of hartshorn, as recommended and practised by M. Lavagna in France, our author observes, that he has "known it to succeed in a few cases of long standing, but that in two cases it excited a considerable degree of inflammation, which extended to the rectum and bladder. Dr. Chesholm, an eminent physician of Canterbury, has employed this remedy, (twenty drops of the spirit of hartshorn in three table-spoonsful of tepid milk) in several obstinate cases of retention of menses, and *in every instance*, he says, with invariable success."

When, notwithstanding our efforts, the uterine secretion is not re-established, it will be useful to imitate nature by taking four or five ounces of blood from a vein in the foot, every five weeks, till the secretion takes place. The use of semicupium, friction over the bowels, riding on horseback, are powerful auxiliaries. Dr. Miller "an eminent German physician," has informed the author, that he has lately administered the tincture of iodine in twenty-five drop doses, twice a day, in retention of menses in scrofulous subjects, with great success.

Chapter VI. *Costiveness of Scrofulous subjects.*—Our author is by no means disposed to believe, with Cullen and others, that scrofula is a disease of debility. He infers this, he says, from the fact, that all stimulants are injurious, and that a vegetable is much better than an animal diet. This is not accordant, however, with the experience of others. Dr. Good regards the disease as one of debility, and directs the adoption of a *tonic* and *stimulating treatment.* Our author states, that he has never known alkaline remedies do any good when an acid did not prevail in the stomach, "or when uric acid did not predominate in the urine, or when the sensible perspiration did not redden litmus paper."

"It appears to us, (says the author,) that scrofula is not pro-

duced by any specific poison or acrimony, but that it is dependant only on original delicate structure and irritability of the whole lymphatic system; and if this idea be correct, the object of practice is not to stimulate the body or any particular system of it, but to keep down irritation in the lymphatic system, and to strengthen it by gentle tonics: and this treatment we have uniformly found beneficial."

Scrofulous patients, observes the author, are very liable to costiveness. It may even be regarded as an exciting cause of scrofulous indurations. *Aperients* are therefore very necessary. It is probably, says he, from neglecting the regular use of mild aperients, in the treatment of this disease, "that remedies which have been highly extolled by *some* surgeons, have failed in the practice of others." He thinks well of the powers of *iodine* in this disease; but if the bowels are not kept in a proper state, "the article is very apt to disorder the stomach and head, and even to excite fever and considerable irritation in the salivary glands."

Jalap, says the author, is the best article for obviating costiveness in scrofulous subjects. His reasons for preferring this substance is, "because it does not disturb either the process of chymification in the stomach, nor of chylification in the duodenum, nor prevent absorption of the chyle, by hurrying it through the small intestines."

The alkaline extract, he says, is the best preparation of the whole; and this may be advantageously given in conjunction with the dried carbonate of soda and an aromatic. Iodine is the only constitutional remedy upon which any dependance can be placed. From twenty to thirty drops of the tincture of this substance, taken two or three times a day, is perhaps the best mode of using it. In cases attended with considerable debility, a decoction of the bark, with "marsh-mallow root or coltsfoot," may be given along with the iodine. Mercury in small doses, frequently proves beneficial; it must not, however, be given to the extent of exciting mercurial fever, or affecting the gums. The corrosive sublimate in very small

doses, is the best mercurial preparation in this disease. As a topical application, the author recommends the following embrocation:

R. Iodine, 20 grains,
Rectified oil of amber, 4 drachms,
Rectified spirits, 2 ounces,—Mix.

Sea-air and sea-bathing are powerful auxiliaries to medicine and diet in the treatment of scrofula.

CHAPTER VII. *Costiveness of Hysterical subjects.*—Costiveness having a particular tendency to determine the circulation to the head, never fails, when it exists, to increase the complaints of hysterical subjects. Aperient medicines are, therefore, of very considerable importance in the treatment of this affection.

"When hysteric fits are occasioned by painful menstruation, says the author, the alkaline tincture of colchicum, twice or thrice a day, with an aromatic aperient and camphorated julap, according to the state of the bowels, is an excellent remedy, as the following draught."

"Take of the ammoniated tincture of colchicum seeds, from two to four scruples; fœtid spirit of ammonia, forty drops; compound decoction of aloes, one ounce. Mix. To be taken two or three times a day."

CHAPTER VIII. *Costiveness of Gouty subjects.*—Gouty invalids are seldom affected with constipation. When the bowels do become torpid and loaded with fæces, the general health, "particularly the head and nervous system, are always much disturbed."

The purgatives for gouty subjects, says the author, should be of an active aromatic character. "The saline aperient mineral waters, sulphur, magnesia, castor oil, Epsom and Glauber's salts, and other supposed *mild* and *cooling* aperients, are apt to disorder the stomach and small intestines,—to interrupt the process of digestion, so as to reduce the vital powers of the system." Active and aromatic purges rouse the vital

powers, excite the abdominal circulation, and prove cordial to the stomach.

The author regards *calomel* and *aloes* as very objectionable aperients in gouty subjects; and he accordingly condemns the compound colocynth pill, so much recommended by Scudamore and others.

He speaks highly of the good effects of the following pills:

R. Extract of elaterium, 10 grains,
Cathartic extract, 2 drachms,
Resin of jalap, Castile soap, of each 1 drachm,
Mix and divide the mass into fifty pills.

The dose is from two to three pills occasionally. Dr. Bethel, "an experienced and scientific physician of Brentford," states that he has found these pills to allay gouty and inflammatory excitement more effectually than colchicum, or any other cathartic or sedative medicine, and, unlike colchicum, to improve the general health; and our author observes, that he has often prescribed these pills in cases of gout and rheumatism, and that their effects generally confirmed the high character given them by Dr. Bethel.

It is improper, however, to employ *active* purgatives frequently. "If employed oftener than twice a-week, for a longer period than a month, they may, and probably will, produce mischief in some part of the intestinal canal, most likely in the colon or rectum." But in cases of torpor of the intestinal tube, it will be necessary to keep up its peristaltic action by the daily use of a *small* dose of some active aperient medicine.

Chapter IX. *Costiveness of Rheumatic subjects.*—We pass over this chapter altogether, as presenting nothing worthy of any particular attention. In the 10th chapter, the author introduces some observations on the "costiveness of plethoric subjects predisposed to apoplexy." That costiveness, in habits of this kind, is attended with additional danger, is too obvious to require any illustration. It tends very powerfully to increase the determination of blood to the brain, and ought to be carefully guarded against in persons predisposed to apoplexy and other cerebral affections. Our author does not approve of

the employment of the aperient neutral salts for the prevention or removal of costiveness in plethoric habits. They reduce the temperature, he says, of the abdomen, and diminish the vigour of the circulation in the portal circle. This we conceive to be perfectly gratuitous. We would always prefer these aperients in cases of this kind, and for the very reason too that the author condemns them; namely, because they are of a refrigerant character. We have no idea of "aromatic pills," in plethoric subjects; nor do we in the least dread the cooling effects of saline purgatives.

Giddiness, says the author, is not, as is generally believed, an indication of cerebral compression. It is a symptom both of plenitude and depletion. It is not, however, always easy to ascertain which of these two conditions of the vessels of the brain is present. The late Dr. Baillie states, that he has often found it difficult to determine the cause of giddiness. When he found himself in doubts, on this point, he ordered the loss of six or eight ounces of blood, by cupping, as a test. If no relief followed this abstraction of blood, and particularly if the symptoms became aggravated, he recommended nervous stomachic medicine.

"In general, we may judge of the state of the blood-vessels of the brain by the appearance of the eyes, particularly if the vessels of the external tunic be considerably distended: this, however, does not afford a certain indication; but, when this appearance of the giddiness is increased by positions of the body that favour the afflux of blood to the head, as stooping, looking upwards, lying down, &c., there can be little doubt of the complaint being congestion of the vessels of the head. We have known patients who had scarcely been free for one month from attacks of giddiness for fifty years, which were sometimes attended with a degree of loss of sense and motion, nearly approaching to apoplexy, but who always experienced an aggravation of the complaint from bleeding. They all died at an advanced age of diseased bowels. Flatulence is a common cause of giddiness, probably by distending the stomach and bowels, so as to compress

the vessels of the belly, and check the return of blood from the head."

The author thinks it strange that those medicines which increase the urinary secretion, should be so much neglected as a means of unloading the sanguiferous system. He very properly regards diuretics as important additions to aperient remedies in cases of plethora, and particularly in cases where a tendency to cephalic congestion exists.

"Long experience," he says, "has satisfied me, that in cases of plethora, it is nearly of as much importance to attend to the secretion of the kidneys as to the state of the bowels: and that plenitude of the sanguiferous system is more frequently the consequence of sluggishness of the kidneys than of the intestinal canal. An asthmatic fit is so generally preceded by a paucity of urine, that all asthmatics are satisfied of the importance of keeping up the action of the kidneys."

CHAPTER XI. *Costiveness attendant on different varieties of Palsy.*—CHAPTER XII. *Costiveness attendant on Piles.*—Costiveness is generally the principal cause of piles, and hence laxatives have always been resorted to as the most efficacious means both for the prevention and cure of this painful affection. In exhibiting purgatives in this disease, it is particularly of consequence not to employ such articles of this class, as have a tendency to irritate the lower portion of the bowels. The author recommends the following pills:

R. Alkaline extract of jalap, 1 drachm; purified pitch, half a drachm. Mix and divide into 24 pills; two or three are to be taken once or twice a-day.

Injections of thin gruel or cold water are very useful applications in piles attended with much irritation of the rectum and colon.

This practice, however, is hazardous;—it is liable, says the author, to produce a sudden determination to the head; more

especially in persons of a full habit, and of an apoplectic make. Cold water is moreover apt to excite colicky pains.

As an external application, he recommends the following ointment:

R. Calomel,	1 drachm,
Spermaceti ointment,	1 ounce,
Flowers of zinc,	½ a drachm,

Mix well together.

"When the irritation extends up the rectum, (says the author,) the soft rectum bougie, besmeared with this ointment, applied for a few minutes every night and morning, when reclining in bed, generally removes the disease in a few days, and will effectually prevent the structural mischief." When the parts are disposed to stricture, or structural mischief, two drachms of the ointment of belladonna may be substituted for the flowers of zinc. If the external skin be excoriated, which is generally attended with an itching pain, and an exudation of serum, some mild astringent lotion may be applied, or the following ointment:

R. Citron ointment,	6 drachms,
Barbadoes tar,	½ a drachm.—Mix.

Chapter XIII. *Costiveness attendant on Jaundice, &c.* Chapter XIV. *Costiveness attendant on Diseased Liver.*—This is a curious chapter. The author vituperates the whole medical profession for ascribing too much pathological importance to the liver. The liver, he says, is every thing with most of the modern *magnates* of our profession; "and the dentists, that class of physicians vulgarly, but not unaptly called *mad* doctors, undertakers, and proprietors of mad-houses, and anti-bilious nostrums, have had no reason to condemn the theory." The liver, according to our author, is not so important but that it may be spared from the system. Brutes, he says, have done well, after having lost their livers; "and Europeans residing in tropical climates, have enjoyed good health after it had been nearly destroyed by suppuration." The bile, according to the author, has nothing to do

with the production of chyle. This may be so; the experiments of Fordyce countenance the opinion, notwithstanding the contrary tendency of those of Brodie. Neither does our author believe that the bile is "the natural cathartic of the intestines." It is much too bland, he says, to perform this office. He has known, too, the passage of the bile completely obstructed, while, notwithstanding, the bowels were relieved regularly every day.

"When considerable irritation exists in the liver or biliary ducts, from a calculous lodged in the principal duct, the bowels are generally constipated; but this is often the case when another organ, either of the chest or belly, is affected with an irritative disease, in consequence of the determination of nervous fluid and blood to the part. That an excrementitious discharge into the intestinal canal may tend to increase the peristaltic motion of the intestines, is, however, not very improbable."

He thinks that the use of the bile in the duodenum, is, "that it may mix with the residue of the chyme after the formation of the chyle, to render it offensive to the mouths of the absorbents, and thereby prevent its being conveyed to the mass of the blood."

"With respect to the office of the colon, which we have stated to co-operate with the lungs, liver, &c. in separating impurities from the blood, Mr. Abernethy observes, the *residue* of the alimentary matter, mixed with the bile, passes from the small into the large intestines, and there undergoes a *sudden* change; it acquires a peculiar fœtor, and becomes what we denominate fæces. This change is so sudden that it cannot be ascribed to *spontaneous chemical alterations*, (which would be gradual,) but it must be attributed to some *new animal* agency. If the contents of the small intestines at their termination, and of the large at their commencement, be examined, they will be found *totally* different, even within a line of each other; the former being without fœtor, and the latter being in all respects, what is denominated fæces. Though *chemists*, then, might speak of the

feculent matter of chyle (chyme?) as fæces, yet *physiologists* would rather apply that term to the change in the *residue* of the food which takes place in the *large* intestines, and which seems to be effected by the vital powers of those organs. 'The fæces,' proceeds Mr. Abernethy, 'quickly suffer chemical decomposition out of the body, although they often remain in the bowels without undergoing the same kind of change. Their chemical decomposition is attended with the sudden formation of ammonia; yet, on examination, when recent, they are found to contain acids which ammonia would neutralize. The inference, therefore,' says Mr. Abernethy, '*naturally* arises that this third process, I mean the *conversion* of the residue of the aliment into fæces, may, amongst other purposes, be designed to modify that residue, so as to prevent it from undergoing those *various chemical* changes which may prove stimulating to the containing organs, as well as injurious to the general health.'

"In a perfectly healthy state of the digestive organs, probably *no chemical* decomposition, *even* of the fæces, takes place; yet changes happen, in some degree without apparently producing any injurious consequences. To *chemical* changes we may *probably* attribute the extrication of *inflammable* air, and the various and unhealthy odours of the fæcal matter which are observable in disordered states of the digestive viscera.

"The alteration in the odour and appearance of the residue of the chyme on entering the colon, is not the consequence of any chemical decomposition, or of 'the action of some new animal agency,' but of becoming mixed with the fæcal secretion of the internal membrane of the colon; and so far from the refuse of the chyme being suddenly and completely converted into fæces on entering the colon, in the contents of the ascending portion of the colon, the residue or rejected part of the chyme with the bile is clearly discoverable from the *true fæcal* secretion of the colon, the former consisting of the refuse of the food, whilst the other is of a thin pulpy consistence; and as the refuse advances into the descending portion of the colon, it becomes more mixed with the true fæcal discharge; but even when evacuated, it is still easily distinguished from the fæcal secretion of the colon on being mixed with water, or on microscopical inspection. In

cases of fevers, or of organic disease of the gullet, where a patient can swallow nothing in a solid or thick form, it is common to have copious evacuations of fæces, which can consist chiefly of bile and the fæcal secretion of the colon. As another decisive proof of the fæces not being a conversion of the refuse of the food into fæcal matter, either in consequence of chemical decomposition and new combinations, or of a *new animal* agency,' we may notice the case of a child, which occurred in the practice of Mr. Hallam, an intelligent and experienced surgeon of Walworth Road. This gentleman delivered a patient of a 'fine muscular, fat, and healthy child, but which had an impervious œsophagus, so that no food ever passed into its stomach. The child lived for *thirteen* days, and was so wasted that its skin hung like a loose garment, and could be folded and lapped over its limbs. At first the child discharged the usual quantity of meconium from the bowels, and afterwards had, during *eight* days, one or two *alvine* evacuations, in quantity, colour, and consistence, not distinguishable from the stools of children who take food in the usual manner. After the eighth day the fæcal discharges became more scanty and less frequent, but they continued to the last."

We intended at first to give a regular analysis of this book; but we find as we proceed, so much common place observation in it, mingled up too with so much crude reasoning and absurd doctrine, that we have it not in our hearts to fill up our pages with the meagre gleanings which might be picked out of the mass of trash of which nearly the whole is composed. It is really astonishing to see how much contemptible stuff is constantly palmed on the public by the ever-industrious book-makers of Europe. Among the many publications which are constantly issuing from the press, there are so few that really deserve serious attention, that it is not a little difficult to keep up the interest of a journal professedly analytical.

ORIGINAL DEPARTMENT.

ART. I.—*Nyctalopia.* Extract of a Letter from T. R. BURDEN, M. D. to B. DELAVAN, M. D. Surgeon in the U. S. Army.

NYCTALOPIA, a disease common to seamen and soldiers in the East and West Indies, and indeed to the natives and visitors of tropical climates, has been known in all ages. In this country it has been supposed to be very rare, I do not recollect having met with any description of it as occurring in the practice of American surgeons, and believe it is generally unknown to the profession in the United States. I am disposed, however, to think that it is not uncommon in the southern sections of the Union; attended with no pain in most instances, and never interfering with the daily occupation of its subjects, persons are not induced to seek surgical aid, and perhaps are sometimes deterred from the dread of an operation which the ignorant think inseparable from the treatment of diseases of the eye.

Whilst attached to the command of Col. Brooke of the fourth U. S. Inf. at Tampa Bay in E. Florida, I met with several cases of nyctalopia. They were the first I had seen, and as is usual with army surgeons at out-posts, I had no surgical works to refer to, and had to depend on my own resources to ascertain the nature and mode of treatment of this imperfect form of amaurosis. The soldiers affected had been stationed at Fort Barrancas, on the western shore of Pensacola Bay, where they were exposed to the reflection of the sun from the white sand which surrounds that fortress.

During the voyage from Pensacola to Tampa, they had all been affected with sea sickness, the inseparable attendant of a storm, without experiencing any change in the diseased vision. They did not apply to me for relief until the troops had encamped, and were engaged in building the cantonment. The appearance of the disease was as follows: During the

day the sight continued unimpaired, but on the approach of night a mist appeared before the eyes, which gradually increased until the patient was totally deprived of sight. He was not sensible of the light of a candle, and that from the bright fires before the tents had no effect on vision. In the morning sight was gradually restored, and he was able to see the most minute objects distinctly and as well as those free from disease. During the day there was no alteration in the natural appearance of the eye, at night the pupil was dilated and motionless. I could not ascertain any intermittent or periodical character in the disease. One soldier was in the hospital with dysentery, which had no effects on the nyctalopia, neither did I perceive that intoxication produced any aggravation of symptoms. The first case I suspected was simulated, as soldiers frequently resort to expedients to escape guard duty, and prefer such diseases as are least likely to be detected by the surgeon. My experience as physician of the Philadelphia prison, had made me acquainted with the mysteries of this class of impostors, and the proper mode of treatment to be adopted with this kind of patients, and suspicion led me in this case to the knowledge of a remedy which has rendered nyctalopia manageable in my hands.

The second was a case in which there could be no motive to deceive, for the man was employed as company clerk, and had no guard duty to perform; he continued at the writing-table of his own accord during the day, but was unable after night to walk out of his tent without a conductor. He experienced no inconvenience from his occupation.

I had six cases of this disease in the month of March, all of which were cured. I left the post in July, at which time there had been no relapses. Viewing nyctalopia as a debilitated state of the optic nerve produced by the reflection of the sun's rays from a sandy shore, and by a damp situation, I did not recur to general and depleting remedies. The incessant vomiting at sea had made no change, and the dysentery in one case had no effect on the diseased state of the eye.

No alteration in diet was directed, as in army practice; I am convinced that in general, it is, to say the least, unnecessary. I treated it as a local disease; adhesive plaister spread on leather the size of the hand, and sprinkled with tartar emetic, was applied to the back of the neck, the part having been previously bathed with warm vinegar. The second application always removed the disease, and restored the patient to perfect vision.

I have since tried this application in various diseases of the eyes, and having been satisfied with the results, I give it a decided preference to the use of blisters or even setons.

In mania-a-potu, when the tartrite of antimony is used, it seems to produce effects not altogether attributable to its emetic property. Whether externally it possesses any other than an irritating power, I am not prepared to say, it has been, however, so successful in my hands in the imperfect forms of amaurosis, that I hope you will give it a trial.

ART. II.—*Case of a Horned Woman.* Marlborough, Montgomery County, Pennsylvania, 10th July, 1826.

DEAR SIR,

I take the liberty to forward for your perusal the following case of a *horned woman*, hoping that from its very rare occurrence, it may prove not unacceptable. The account may be relied on, as many others besides myself have seen her, and as she resides but five miles distant from this place.

Mrs. B———, aged about seventy years, the wife of a farmer of Bucks County, of a robust constitution, was affected four years ago, with a very troublesome itching over the centre of the parietal bone of the left side. In a short time she perceived a hard tumour of a horny structure occupying the place thus affected, which continued to increase, so that by the end of twelve months, it had attained the length of one inch. Without any considerable pain, it has progressed in its growth, an inch every year, and is at present four inches

in length, and as thick as one's little finger.—It is not attached to the bone, but is evidently an affection of the cuticle; commencing with a granular hour-glass-shaped tumour of three-eighths of an inch in length, from which the horn abruptly rises. After growing straight for one inch and three-quarters, it takes a spiral direction, and has completed nearly a circular turn and a-half horizontally, of about the diameter of a quarter dollar piece. In appearance it so closely resembles the horn of a buck sheep, that was it placed near a real sheep's horn, it would be difficult to distinguish between them. It is of the same colour, a dingy yellow; is as perfectly hard, and has all the rings natural to a horn of that animal, tapering also, as it does, to the end. As it occasions no pain, except when a blow compresses its fleshy base between the horn and the bone.—As it is perfectly concealed by her head dress, and on account of what is of far more moment with her, a superstitious belief that it is a judgment from above, for some of her manifold sins, she resists all persuasion to have it removed. With sentiments of gratitude,

I am yours, &c.

DR. B. RUSH RHEES. GEO. R. MORTON.

ART. III.—*Some experiments and remarks on Galvanism.* By J. GREEN, Prof. Chem. in Jef. Med. College.

The following experiments and observations were made some years since, when the subject to which they relate was in this country comparatively new,—they may perhaps still be interesting to those who are commencing their researches in this important field of chemical philosophy.

The galvanic instrument employed, consisted of two large sheets of copper and zinc, about two and a-half feet wide, and twenty-five feet long, placed one above the other, and then rolled into a concentric coil—the metals being carefully kept asunder by little strips of wood and pieces of cork—the

poles of the battery were about three inches apart, and consisted of little forceps, one soldered to the zinc coil, and the other to the copper coil, which was exterior. The instrument was suspended by a cord, pulley, and weights, over a large tub, containing a very dilute mixture of sulphuric acid and water, for the purpose of exciting the battery, and which could be immersed or withdrawn from the fluid at pleasure. With the above arrangement, the following experiments were made:

Exp. 1*st. Decomposition of Water.*—This was performed by placing a watch crystal filled with water near the forceps, and then forming a communication between them under the water, by means of two iron wires. Immediately on bringing them into contact, a bright flash was observed, and bubbles of gas were seen at their extremities. This was either occasioned by the combustion of hydrogen, or the deflagration of the iron.—I expected the decomposition would have taken place when the wires were at a short distance from each other, as in the same experiments with *mechanical* electricity; but there was no visible effect till the instant of contact. By separating and rejoining the wires, the experiment may be repeated two or three times; but afterwards it is necessary to remove the coils from the acidulous fluid, before it will again succeed.

Exp. 2*nd. Heating and fusing Metals.*—When a polished iron wire is used to connect the poles of the battery, its colour varies according to the heat produced by the galvanic action. As the coils descend into the acidulous fluid, the first colour which appears is a dusky yellow, this soon changes to an iridescent blue; then the wire becomes red hot, and afterwards, if the machine acts with energy, it has a white heat; but if the instrument does not act with sufficient power to produce white heat, the other colours may be observed to the greatest advantage. The different tints of colour noticed in the above experiment, were thought to depend on some change in the arrangement of the metallic particles pro-

duced by the heat, and not on oxidation, as they occur when wires are heated under mercury or oil; but Mr. Stodart has proved in his accurate experiments on tempering steel, that these colours arise from different degrees of oxidation. Between 430 and 450° of Fahrenheit, steel assumes a pale yellow tinge; at 460° the colour is stone yellow; this gradually deepens as the temperature rises—it then passes through brown and purple; at 590° it becomes a uniform deep blue; we can thus judge of the temperature of steel by its colour. If the smallest interruption be made in the wires which connect the poles of this instrument, no heat is produced—some pulverized gunpowder mixed with camphor, was placed between the wires, which were not more than the sixteenth of an inch apart, and iron filings were then sprinkled between the small interruption, but without effect; on *touching* the wires, however, the powder exploded.

Exp. 3*d. The effect of the battery on thin Wire.*—Iron wire about the sixteenth of an inch in diameter was readily ignited; but when very small wire was used, no ignition took place, and even upon passing three or four folds of this fine wire between the poles of the instrument, not the smallest effect could be discerned. This last fact may perhaps be explained on the principle, that although the quantity of iron to be heated is small, yet the surface exposed to the air is considerable, so that the cooling power of the air has a greater influence than on a single wire of greater diameter. This reason does not, however, apply to the case of the *single* fine wire. That the surrounding air has a great cooling influence on the temperature, has been beautifully illustrated by stretching a wire through a glass vessel over the receiver of an air-pump; on exhausting the air of the vessel, the wire may be ignited by a galvanic battery, but no ignition will take place when the air surrounds the wire. It is a curious fact, that a fine wire which cannot be ignited by a *large* galvanic machine, may very readily be fused by a *small* one. This has been attributed to the different *galvanic intensities* of the two instruments; an

explanation which is, perhaps, as difficult to understand as the fact itself.

Exp. 4th. Ignition commonly begins near one of the Poles.—In burning wire with the instrument above described, the heat or redness usually first made its appearance at one or other of the poles, generally at the position pole. This is analogous to the fusion of wires by mechanical electricity, for we know that if a strong shock from a common electrical battery be sent through a slender piece of metal, the points at which the fluid enters and issues are most likely to be melted. In Mr. Children's experiments with his magnificent battery, which is the most powerful in *colorific effects* that has ever been constructed, most of the wires were instantly heated red hot throughout their length, and the only case of slow fusion mentioned, took place near one of the poles. Positive electricity is supposed to be more active than any other electricity; we might therefore expect that the disengagement of heat produced by electro-chemical action, would first manifest itself at the positive pole of the battery.

Exp. 5th. On the smoke which rises from heated wires.—Before the ignition of metals by the instrument above described, a kind of smoke was always seen rising from them. This apparent smoke is no doubt to be ascribed to an oxide of the metal in the form of a fine powder thrown from it by the violent action of the caloric. The colour of the smoke is different when different metals are used, that from lead was of a light gray colour; from tin, it was white; from iron, brown; and from brass, purple. All these appearances have been observed, when metals have been fused by mechanical electricity.

Directions for Using the Galvanic Battery.—The following directions may be useful to the student.

1st. On plunging the coils of zinc and copper into the exciting acidulous fluid, if the wire does not immediately ignite, they must be instantly withdrawn, and suffered to remain a minute or two in the air, and a new clean wire substituted

for the one between the poles, before they are replunged. This failure in the experiment, perhaps, arises from the previous oxidation of the wire; oxides of metals being non-conductors of electricity.

2d. The wires which connect the poles of the battery should be removed when the instrument is not in use.

3d. The wires should remain in the acidulous fluid as short a time as the experiment will allow, for this is rapidly dissolved by the acid; indeed, with the most skilful management the zinc part of a galvanic battery is soon destroyed.

4th. The lower edges of the coils always become corroded or oxidated first, being the first part immersed, and the last removed from the acid solution; it will therefore be expedient after the instrument has been used for some time to *invert* the zinc coil.

5th. The best proportions for the solvent, or acidulous fluid are, about one part of common sulphuric acid, one of salt, (mur. soda,) and twenty-four of water. When this mixture is newly made, the coils always act with the greatest energy; but after some time, when it becomes neutralized by the zinc, the action is either wholly suspended, or greatly diminished. Thus we see that both the disengagement of heat and electricity bears some proportion to the intensity of chemical combination.

6th. The coils should be washed with water, or suffered to remain in the air after every experiment.

A brief Historical notice of the Instrument.

Dr. Wolloston's pair of small plates appears to be the first instrument of this kind used. It was composed of a small silver thimble without its top, flattened till the opposite sides were about two-tenths of an inch asunder; a little plate of zinc was then slipped in between the sides, and metallic contact prevented by a coat of sealing-wax along the edges. With this little apparatus minute wires were ignited.

The next instrument was the immense battery of Mr. Children, it consisted of twenty pairs of copper and zinc

plates, each six feet long, by two feet eight inches broad; these were connected by leaden strips; they were suspended from a beam of wood, and having counterpoises, were easily raised or let down into the exciting liquids. The power of this battery was prodigious, it ignited six feet in length of thick platinum wire, through its whole length.

The third instrument is by Professor Hare, of the University of Pennsylvania. Dr. Ure, in his Dictionary of Chemistry, speaking of this instrument, observes, "Dr. Hare, of Philadelphia, has lately contrived an ingenious modification of Dr. Wolloston's single igniting pair, which, from its great power of exciting heat, and its small electric intensity, he has styled a calorimator." As Dr. Hare's battery is so generally known, a description of it will be unnecessary.

The fourth instrument is the one I possess,* this was constructed by Mr. Lukens and Dr. Patterson; of this, Dr. Cooper of Columbia College, S. C. has made the following alteration. Nine spirals of zinc and copper, arranged in the manner before described, were connected together, and plunged into nine glass tumblers, five inches deep, and four in diameter; the spirals exactly filling the tumblers, uprights and pullies were so adjusted that the spirals could be immersed or withdrawn from the tumblers which contained the acid, simultaneously. This last instrument, and some other modifications of it, which have been since made, bring us round to Mr. Children's battery.

---

* It ought perhaps to be mentioned, that although experiments on heating and fusing metals, were performed with the battery as above described, yet, that similar experiments were made when the copper and zinc coils were divided into two equal parts, so as to form two pieces of equal dimensions.

ART. IV.—*An Extract from an Inaugural Dissertation on Neuralgia, submitted to the examination of the Medical Professors of Jefferson College, Philadelphia, for the Degree of Doctor of Medicine.* By JOEL FOSTER, of Vermont.

NEURALGIA being a local disease, and generally confined to certain parts of the system, has been divided by Dr. Good into three species, his division being founded on the locality of the pain.

Without regard to the cause of this affection, or its features, authors have described it under the common name of tic douloureux, with scarcely hinting at its varieties.

If this disease admit of any division, I think it would be preferable to confine such a division to the causes which produce it, with the general appearance, symptoms, &c.

The symptoms exhibited in the variety arising from inflammation of the neurilema, and that arising from functional derangement, being of an opposite character, and consequently requiring a diametrically opposite treatment, would, I think, serve as some apology for a division.

Were it not the fact that neuralgia arising from different causes demands a different treatment, I should be content with describing it under one general form; I do not, however, wish to be understood that it is necessary to divide it into separate diseases, but only different varieties of the same disease. By making this division it may be described with greater perspicuity.

It may with propriety be divided into four varieties.

1st. Neuralgia arising from functional derangement of the nerve.

2d. Neuralgia arising from an organic affection of the brain or its meninges.

3d. Neuralgia arising from inflammation of the neurilema.

4th. Neuralgia arising from mechanical irritation.

The first variety is by far the most frequent. It is evidently confined to the nerves of general sensibility. It com-

mences with a peculiar and inexplicable sensation, which occasionally produces slight palpitation, or difficult respiration. The patient is destitute of fever, but enjoys an indifferent state of health.

The first attack is slight and gradual, but seldom remains any considerable length of time, before the attacks of pain become more acute and lancinating. The paroxysms are almost instantaneous; darting like a shock of electricity along the course of the nerve to its extremity, when the pain as suddenly ceases as it commenced. The paroxysms are very irregular in this variety; frequently several occur in the course of a few minutes; again, a considerable time may elapse without its return; the duration seldom exceeds a few seconds, when a complete intermission takes place.

It rarely happens that both sides of the face are attacked at the same time, yet in protracted cases it sometimes occurs. The pain is more violent during the day than in the night, probably depending on the greater quantity of stimuli during the day, or the motion in mastication. The return of the paroxysm is accelerated by conversation, or much mental emotion. The countenance is generally pale and livid, and the skin flaccid.

The pulse is weak and gaseous. Although the pulse in some cases may be frequent, still there is no redness, unless it be caused by friction, or external stimulants. The disease seldom remains long confined to one particular nerve, but gradually extends through the different ramifications of those contiguous.

The eye-brows are knit, and the eye is sometimes watery. The nervous invalid, at once the victim of fear, indolence, and imbecility, is no sooner free from the paroxysm, than he complains of the sufferings he has endured, in language the most energetic.

Dr. Nelson, of Montreal, observes, "that in patients afflicted with neuralgia arising from debility of the nerve, the pain frequently extends over every part of the face, so numerous

are the nervous ramifications." He observes, "that after the disease has remained for a considerable length of time, it frequently alternates from one side of the face to the other." This, unless relief is obtained, will often emaciate the system, and impair the mental faculties.

There cannot be any doubt with regard to the seat of neuralgia in all its varieties, the name itself sufficiently designating the location of the pain.

It commences in frontal neuralgia in the supra orbitar foramen, it follows the frontal nerve to its extremity, and generally passes down to the bottom of the orbit. When the second branch of the fifth pair is first affected, the pain is over the os malæ, immediately beneath the orbit, in a line from the pupil of the eye to the intermediate space between the bicuspides, and cuspidati teeth.

When the third branch is the seat of the affection, the pain is first felt at the canalis mentalis, the lower jaw, chin, and lip being the parts that suffer.

The portio dura of the seventh pair is frequently the seat of neuralgia; here the pain commences at the foramen stylo-mastoideum. As this nerve ramifies with all the nerves of the face, and the posterior cervical, the disease very soon extends over the face and neck, all the nerves of that side of the head participating with it.

Almost all the nerves of general sensibility throughout the system have been known to be affected with this disease. It sometimes attacks the hand and arm. Mr. Good relates a case of neuralgia affecting the breast of a young female; "the organ was full formed, soft, and globular, without the slightest degree of inflammation or hardness." He likewise observes: "The laminating shoots darted both downwards in the course of the circumjacent ribs, and upwards to the axilla, whence they afterwards descended to the elbow." A respectable practitioner of this city informed me, that for upwards of four years he was afflicted with neuralgia. It commenced at the heart; the pain was excruciating, and darted with the rapidity

of an electric shock, the pain however, would instantly subside. At length the disease was translated to the lower extremities, the sciatic nerve became affected, the pain would follow the nerve and its anastamosing branches towards the foot, the attack was instantaneous, and the continuance of pain generally transient.

I witnessed a case in the summer of 1825, in which the disease was located in the foot and ankle. In general, when tic douloureux occurs in any part of the system, it exhibits the same appearance as when located in the nerves of the face.

Having considered the locality of this variety, I now proceed to enumerate some of the causes which produce it. The first that I shall mention are the

Predisposing causes.—They whose sensibilities are most acute, and whose imaginations are most vivid, are generally the most frequent subjects of this variety of neuralgia.

Exciting causes.—When the nervous system is in a state of debility, or when the functions of the system have become impaired, slight causes may produce it. Any thing that deranges the digestive apparatus, such as an indulgence in debauchery, a sedentary life, intense study, the various passions of grief and anxiety, all conspire to render the nervous system liable to an attack. Irritating substances in the alimentary canal operate as an exciting cause, in a manner which cannot easily be explained.

The nervous system may be in a state of debility, yet it requires an irritation of some one of the nerves of general sensibility, before neuralgia can be produced. It is not essentially necessary that the nerve wherein the sensation of pain is felt should be the one irritated, because it is very evident that the stomach is often the seat of the irritation, in this as well as in tetanus. We know that by irritating the fauces with a feather, the stomach is excited to a spasmodic action, and the contents of the organ are rejected. In hepati-

tis, a severe pain is felt at the top of the shoulder, although the seat of the affection is in the liver.

The sympathetic nerve has its origin from a recurrent branch of the fifth, and a filament of the sixth pair of nerves. It receives its origin in the cavernous sinus, and passes through the foramen carotideum; it receives branches from the portio dura immediately on its exit from the cranium. Irritating substances in the stomach produce the sensation which is conveyed to the sensorium commune, and is reflected to the face. Although from the intricacy of the intersections and decussations of the nerves, it is impossible in many cases, to determine why one set of nerves should suffer while another remain unaffected, yet in many cases by attending accurately to the primary symptoms, we may be able to obtain some knowledge of the physiology of this exquisitely curious disorder.

When this variety has remained a considerable time, there can be but slight difficulty in distinguishing it from the other varieties. The peculiarly pale and flabby appearance of the countenance, the character of the pulse, and the complete intermission of pain, will, I think, in all cases serve as a sufficient diagnosis.

Treatment.—If we are acquainted with the causes which produce this variety, the treatment will be obvious. If it arise from a debilitated nervous system, tonics in large and repeated doses are indispensable. In almost every case the digestive apparatus is impaired. This should not escape our attention; the constitutional treatment should be regulated accordingly. Calomel in small doses, such as one-eighth of a grain, to one-half a grain at night, alternating it with some kind of eccoprotic purgatives. The blue pill administered in doses of from two to five grains in the evening; this in dyspeptic complaints is preferable to any form of mercury as an alterative. Powerful or drastic purgatives, where the debility is considerable, are not admissible. Emetics have

been employed by some practitioners with success, to prepare the system for more efficient remedies. A moderate purgative might occasionally be beneficial to arouse the dormant energies of the alimentary canal. When the digestive functions have been corrected, and the patient put upon a farinaceous diet, we may commence the use of tonics. Sulphate of quinine has been recommended, and has been employed successfully in some cases. Arsenic has likewise been serviceable in this form of neuralgia, but these are doubtful remedies.

The extract of stramonium has been employed by many physicians, especially by Dr. Marcet; this, however, was often capable of giving only temporary relief. Stimulants have been used in some instances with an idea that the system was preternaturally debilitated, and in some cases have been useful.

Iron has been employed by Mr. Hutchinson, an European surgeon of respectability. He remarks, that "iron of all metals is least injurious to the animal system, and cannot be ranked as a poison." The same author observes, that "it acts as a powerful tonic, increases the general excitement, promotes the digestive powers, and gives a florid hue to the blood." The preparation employed by him was obtained by combining in certain proportions, solutions of the sulphate of iron and the carbonate of soda together, when a mutual decomposition takes place, sulphate of soda is formed, which remains in solution. The carbonate of iron is precipitated, of a green colour, this soon absorbs more oxygen in the process of drying, and is converted into the carbonate of the red oxide of iron. This is much more powerful than the common carbonate of iron of the shops. It should be given as directed by him, in doses of half to two drachms, three or four times in a day. This will seldom fail of producing a radical cure. I witnessed a case last season of this variety, the patient had been afflicted fifteen months, almost every article of the materia medica had been prescribed, without success; bleeding had been practised, but this appeared to aggravate the disease. The different tribe of narcotics, me-

liorated the patient's sufferings for a short time only. At length iron was prescribed in doses of half a scruple, three times in a day. The dose was soon increased to half a drachm, and the patient was in a short time restored to perfect health.

In this form of neuralgia, bleeding evidently protracts the cure, and therefore ought never to be practised. The seeds of stramonium have been administered successfully by some practitioners, but in the case alluded to relief could only be obtained from the iron.

The second variety of Neuralgia, or that arising from an organic affection of the brain, or its meninges.—This variety is fortunately of rare occurrence, yet the physician has the misfortune sometimes to meet with it, and to deplore the poignant sufferings of his patient, and fruitlessly searches his materia medica in expectation of procuring relief.

The symptoms denoting this variety, are a pungent pain in the head, generally stationary; frequently partial hemiplegia supervenes an attack; the eyes are red and suffused with tears. As the disease progresses, the face becomes exceedingly distorted, the tongue is drawn to one side of the mouth, and the commissure of the lips towards the ear. The sense of hearing is frequently impaired; often the intellectual faculties become deranged. The paroxysms are not well marked; generally there are no regular intermissions, but only slight remissions.

Exciting causes.—The brain being diseased, may produce this variety, by rendering the nervous system peculiarly irritable. A morbid thickening of the dura mater, an ossification of that membrane, or a spicula of bone projecting into the cranium, may in some instances produce it.

Authors state that a preternatural hardness of all the membranes investing the brain, has been discovered on dissection. As I have seen but one case of this variety, and as that occurred near the commencement of my medical studies, I can say nothing from my own observation; I can only say, that

authors have given their testimony of its existence. This may be readily distinguished from the other forms, by the contortions of the countenance, the great effusions of tears, &c. After this variety has existed for a considerable length of time, the slighest irritation will produce convulsions. The seat of this is evidently at the origin of the nerve, notwithstanding the pain is felt at the extremity.

Treatment.—The remedies in this form of neuralgia, can do but little more than to protract our patient's existence, and meliorate his sufferings. A radical cure can scarcely be looked for. Venesection once in two or three weeks is proper to allay irritation. We should attend particularly to the digestive organs; mild purgatives have been recommended. When general bleeding becomes of little benefit, cupping may be substituted.

The diet ought in all cases to be spare, the patient abstaining entirely from all kinds of spirituous liquors and stimulants, at the same time avoiding mental excitement.

The third Variety.—The symptoms indicating this form of neuralgia, are very great tenderness, heat, and redness of the face; frequently there is at the commencement, a peculiar kind of paralysis, or rigidness of the muscles of the face, which soon become extremely irritable. The pulse is generally above the natural standard, and somewhat tense, the intermissions are not complete, yet there are frequent remissions. The pain is always augmented by coughing or sneezing. Where this form of the disease occurs in a part remote from the face, the paroxysm will increase in severity on moving the affected limb. The limb is frequently tumefied, exhibiting the appearance of inflammation in a slight degree, at the commencement. At a more advanced stage the inflammation is increased, the most trifling irritation exciting the most exquisite pain. The patient on attempting to masticate his food, when the disease is seated in the nerves of the face, will suddenly be prevented by a recurrence of the paroxysm. He dreads the least motion; his fixed attitudes and the peculiar

anxiety of his physiognomy much better portrays the intensity of his sufferings, than any verbal description.

The inflammation present, will distinguish this from the other varieties. Pressure on the nerve always increases the pain, whilst in the first variety, the pain is mitigated by pressure.

Exciting causes.—These are such as injure the texture of the nerve or neurilema. Contusions and lacerations, by creating inflammation in the part, may act as an exciting cause. Cold applied to the face or other sensible parts, produces inflammation of the neurilema, which becoming thickened, presses directly upon the nerves that are already preternaturally debilitated, and operate in a direct manner in producing it. The nerves that have suffered in this variety are found on dissection to be indurated and discoloured.

Treatment.—The remedial agents should first be directed to the general system. Venesection frequently repeated until the inflammatory symptoms are subdued, and the detraction of blood by cupping and leeching, have been recommended as highly serviceable. Purgatives might be employed in combination with venesection. Blisters and issues have been recommended by high authority, as being particularly necessary to reduce the inflammation; keeping up a constant drain from the most inflamed part, by means of an issue, has likewise proved serviceable. Moxas have been applied with success in some cases, after the usual remedies had failed. They should be applied directly over the nerve; the effect of moxas in this disease is stated to be decidedly beneficial, as they have in many instances produced a cure with the assistance of constitutional remedies. Narcotics and tonics have been much celebrated. The former would probably be serviceable after the inflammation was reduced. Their success has warranted their employment.

The division of the affected nerve has been practiced by many surgeons, in this as well as the other varieties of neuralgia, and although relief is sometimes obtained by the operation, yet it is seldom permanent.

Where this is seated in the extremity of a limb after constitutional and local remedies have failed, some have advised amputation of the extremity affected. A case of this variety occurred in Woodstock, Vt. A young lady, aged about twenty, imprudently exposed herself to cold by emersing her arms often in cold water. Slight inflammation resulted in consequence. After the lapse of a few days, she was attacked with neuralgia, located in the thumb. The pain usually commenced in the hand, and terminated at the extremity of the thumb. Almost every therapeutic agent that the sagacity of several experienced physicians could devise, was in this instance tried in a long succession, without affording more than temporary relief. She continued nearly in this situation two years, when her hand became tumefied in a slight degree, the swelling soon followed the arm above the elbow. Blood-letting was extensively employed to relieve the irritation, this likewise proved abortive. At length the division of the nerve was recommended, as the only means of cure, this was accordingly performed by amputating the thumb. For several days the pain was mitigated, until the stump ceased to discharge, when the former severity of the pain returned. The nerve was discovered to be indurated and slightly enlarged.

The cause of the disease in the case alluded to, was evidently an inflammation, and thickening of the neurilema. The sensibility of the nerve after a few months became obtunded by the violence of the action, the disease appeared to wear itself out, and the patient gradually recovered. Dr. Gallup, of Vermont, recommends the administration of emetics, after the employment of venesection. He likewise advises the vapour bath. The use of these remedies, he asserts, will lessen the great irritation, and lay the foundation of a radical cure. He says, "we ought in all cases, to avoid whatever would produce irritation of the nervous system; instilling a cheerfulness of spirits, and soothing conversation might prove valuable auxiliaries in this disease."

The fourth Variety.—This usually makes its attack with slight sensations of pain. Depression of spirits is generally

a premonitory symptom. The pain at the commencement is scarcely perceptible, at length it becomes severe and pungent, traversing the course of the nerve with great rapidity. When it originates from the irritation of a tooth, the pain frequently darts through the course of the maxillary sinus, commencing at the source of irritation. The pain is extremely exquisite, the slightest mental agitation generally produces a paroxysm. The nature of this variety will distinguish it from the other forms of this disease.

Exciting causes.—They are all those extraneous substances that produce irritation of the nerve. The most common cause is the presence of some foreign body, directly in the region of the nerve, which frequently remains harmless for months or years without producing it. At length the nervous system becoming peculiarly sensible, either by disease or debauchery, is easily acted on by slight causes. A bullet, or small shot, lodged in the neighbourhood of a nerve, or a detached spicula of bone, may and often does act as a powerful agent in producing it. This variety is often occasioned by caries of the teeth, or a portion of the jaw. The nervous filament supplying the diseased tooth, first receives the irritation and transmits it to the brain, from thence it is reflected to the trunk of the nerve. A fang remaining in the jaw after the extraction of a tooth, or the periosteum enveloping the tooth, may become morbidly thickened, and press immediately on the nerve supplying the teeth. Mr. Bew, in his treatise on tic douloureux, observes that a great proportion of the cases of tic douloureux which have fallen under his notice, arose from the irritation of the teeth. He remarks, that the dens sapientia, as it forces itself through the surface of the gum, presses against the contiguous tooth, and acts in a manner similar to a wedge.

He says, "if the finger be placed on the tooth affected, producing pressure, the patient will shrink from the pain excited by it, in this manner we may distinguish the one causing the mischief."

Authors have described this as arising from nodes on the

cranium, from the sequelæ of syphilis: these occur in debilitated constitutions from a thickening of the pericranium. A mercurial course will dispel the nodes, but the neuralgia remains unabated.

Treatment.—It is obvious that in the treatment of this variety, our first object should be to remove, if practicable, whatever may act as an exciting cause. The extraneous substance will continue to protract the disease, while it is suffered to irritate the nerve. If it arise from an offending tooth, it has been recommended to remove it immediately.

Our treatment after the removal of the extraneous body should be, to reduce the morbid action of the system. Leeches and cathartics would be essentially beneficial, as also an emollient poultice applied to the surface of the part occupied by the extraneous substance. The application of the moxa, directly over the affected nerve, would prove a valuable remedy in the cure of this form of neuralgia. The internal use of narcotics has by some been highly recommended. The cicuta, maculata and stramonium, are the narcotics generally employed.

Should the irritating body be lodged in a part that might render the removal hazardous, the probability of relief would be much diminished. If any inflammation exists, venesection should be practised. The moxa applied over the nerve might meliorate the patient's sufferings.

The lead cerate has been recommended to be applied over the trunk of the nerve; this, although producing paralysis, will sometimes relieve the pain.

In patients where the removal of the extraneous body is precluded, they should be prohibited the use of alcoholic drinks, their minds should be kept tranquil. Narcotics and antispasmodics might here be serviceable, also an emollient poultice applied to the part.

As neuralgia has been treated by authors generally under the common head of tic doulourex, the treatment has been similar in all its varieties. Many surgeons have strenuously

urged the necessity of dividing the affected nerves in all cases; but the operation appears to afford only a temporary alleviation, the divided ends of the nerve soon uniting, the nervous influence is conveyed as usual to its extremity. It is a settled point in physiology, that by a growth of fresh matter, or by the approximation of the divided ends, the functions of a nerve are restored.

A portion of the nerve has been insulated and removed to prevent the reunion of the divided ends, and thus tranquillizing the patient with affording only temporary relief. We know when an artery is secured with a ligature, the anastamosing branches soon become dilated, and the limb is supplied with blood. A similar result takes place in a divided nerve, inosculating filaments are enlarged, and soon transmit the nervous influence to the part which is the seat of the disease.

In almost all cases relief is not obtained without the aid of medicine, to destroy or diminish the susceptibility to return. The easy manner of treating successfully the variety arising from functional derangement of the nerve, by the internal use of the carbonate of iron, might supercede the necessity of an operation, as it would produce deformity, and do but little in expediting the cure. In that arising from an organic affection of the brain, it would be of trifling importance, or perhaps augment the patient's sufferings.

Many surgeons of eminence rely entirely on the success of the operation for the relief of their patient. On the other hand, surgeons of equal eminence declare the operation in most cases unnecessary. A surgeon of the highest rank in this city, observes, that in nearly fifty cases of neuralgia, that have fallen to his care, he has not had recourse to the operation in a single instance. He therefore regards it as unnecessary.

The croton oil has been employed in this disease, by dropping it on the tongue, but this is now seldom used. Magnetism was formerly a favourite remedy in France. This

probably was productive of considerable benefit. Most of the powers of the magnet must have been produced from a powerful impression made on the imagination.

A case is related by Dr. Fothergill, of a man afflicted with severe neuralgia, who had the power of controuling the paroxysm if he resolutely sat down to play at cards, a game of which he was particularly fond, when the pain would generally cease before he had played more than one or two games, and whilst his mind was completely absorbed no paroxysm occurred. This happened too frequently to be accidental. In every variety of this disease it is of the utmost importance to keep the mind perfectly tranquil; this may not perfect a cure, but will serve as a useful auxiliary.

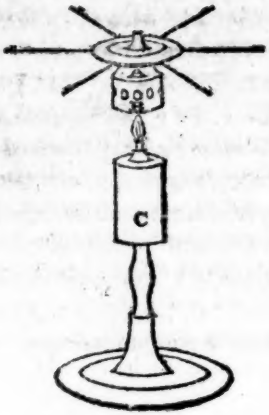
ART. V.—*Chemical Apparatus—The Calorifitor.* By J. GREEN, Prof. of Chem. in the Jefferson Medical College.

THE following contrivance is intended to illustrate the familiar fact, that different metals conduct caloric with different degrees of facility; thus if one end of a silver rod or wire be applied to the flame of a candle, the heat will be felt much sooner at the other end, than if a rod of any other metal of equal length and diameter had been used. The relations which the metals bear to each other in respect to this property of transmitting caloric, is usually exhibited with the instrument first devised by Dr. Ingenhowz, but the effect of the heat on the wax placed at the ends of the wires used in this experiment, can be seen by those persons only who are near the instrument. The object of the following contrivance is to render the experiment satisfactory to a large class of students. The accompanying figure will require but little explanation to be understood. A, is a flat brass plate with a conical opening in the centre,—into the circumference are screwed or soldered several rods or wires of the same length and diameter, but of different metals, the ends of the rods are flattened to receive each a small piece of phosphorus. B, is a hollow cylinder of brass screwed into the lower surface of A, and in which there is a number of small holes to permit a free circulation of air. C, is a spiral lamp, over which A, B, is to be placed after the phosphorus has been applied to the ends of the different metallic bars. By this arrangement it will be seen that the plate A will be equally heated, and the relative conducting powers of the different metallic rods will

be shown by the inflammation of the phosphorus at their extremities. If six rods should be used, viz. a silver, a copper, a tin, a zinc, an iron, and a lead rod, the phosphorus on the end of the silver rod will take fire first, because it is the best conductor of caloric; then the phosphorus on the copper and tin will be ignited, which are nearly equal in their conducting powers; and last of all, that upon the leaden rod. Perfect accuracy must not be expected with this instrument, an illustration of the general principle is all that is attempted.

That the passage of caloric through a metallic rod is gradual, or that it is successively propagated from the particles which are near the source of heat, to those which are more remote, may be shown by screwing a long rod into the circumference of the plate A, and then placing upon it two pieces of phosphorus, one piece at the middle of the rod and the other at the extremity farthest removed from the plate; in this case the first piece of phosphorus will take fire much sooner than the other.

While on this subject I will mention that my friend Dr. De Butts, of Baltimore, has a very neat way of exhibiting to his class the increase of temperature produced, by mixing cold sulphuric acid and water together. A watch crystal containing a small piece of dry phosphorus, is floated on the surface of water in a convenient glass vessel, sulphuric acid is then to be added, and upon stirring the acid and water a little, the phosphorus inflames by the heat thus produced. This I think a much more striking manner of exhibiting the fact, than the boiling of ether in a glass tube, which is sometimes shown.



ART. VI.—*Three cases of Specific Tumours in the Neck, which were successfully extirpated.* By GEORGE M'CLELLAN, M. D. Professor of Surgery in Jefferson College.

MOST practitioners, in this country, regard operations for the removal of large tumours from the neck and throat, as particularly dangerous; and this opinion has been strengthened not only on account of the numerous blood-vessels and nerves which must necessarily be interfered with, but also by the supposed fact that the respiratory organs and the nerves, as well as vessels, are exceedingly liable to fatal inflammations after such operations. An eminent and most authoritative teacher of surgery, in this city, was formerly in the habit of announcing the history of an operation which left the great vessels and accompanying nerve, on one side of the trachea, exposed to the influence of the air, for a short time, in consequence of which, as he conceived, death speedily ensued. This detail was always followed by a denunciation, from the same chair, against all similar operations; and it is not surprising, therefore, that a general and deep rooted prejudice should have obtained in regard to this subject.

It should be recollected, however, that it always requires more than one case to establish a precedent. As the old adage has it—*one swallow does not make a spring.* In opposition to all the unfavourable conclusions which may be drawn from this one case, might be set down many fortunate operations of the same kind which have been performed by other surgeons in different parts of the world. In addition to the decisive testimony which I have received upon this head from several professional-friends and correspondents, my declared opinion in favour of such operations, under ordinary circumstances, has recently been confirmed by my own experience. As I do not intend to dilate upon this subject, at present, I will content myself with the following concise account of three cases which have appeared to me to be worth the trouble of recording.

Case I.—Some time in the autumn of the year 1824, Mr. Christian Staurich, a respectable victualler from Penntownship, applied to me for the treatment of what then appeared to be a large, irritable, and phagedenic ulcer, with an elevated base near the top and a little on the left side of the sternum. A similar one, on the lower portion of the same bone, had previously been cured by the caustic application of an empiric, or regular cancer doctor. In the centre of the cicatrix, however, there remained a small fistulous orifice, which discharged sanious matter, and conducted the probe obliquely upwards to a carious portion of the sternum. As I soon succeeded in destroying the caries, and in healing up the fistula, by the occasional introduction of diluted nitro muriatic acid, and more especially as the ulcer at first appeared to improve under the use of sarsaparilla and the blue pill, I felt myself authorized to ridicule the opinion of the quack. The patient, however, resolutely persisted in the belief that he had been afflicted with cancer; and insisted upon it, that if I would "only cure the sores which Mr. —— had left, after burning out the lumps," he should soon be well. On inquiry, I then ascertained for the first time that the ulcers had both been preceded by tumours of considerable size, which the empiric had attempted to destroy by caustic plasters. This circumstance immediately excited a suspicion in my mind that the disease had originated in a growth of medullary substance from the periosteum of the sternum; and this view of the case was soon confirmed by the appearance of a tumefaction in the tendinous head of the sternal portion of the *sterno-mastoideus* of the same side. Under the use of the constitutional treatment, however, the ulcer continued to present a more favourable appearance, and after the repeated application of lint dipped in strong nitric acid, to produce a sloughing of the morbid structure which constituted its basis, complete cicatrization was finally effected.

But the swelling of the inner edge of the tendinous origin

of the *sterno-mastoideus* continued to increase, and notwithstanding the constant use of large doses of cicuta with sublimate, and other constitutional remedies, it eventually acquired so much bulk as to prove a source of considerable inconvenience both to respiration and deglutition.

On the 28th of July 1825, the integuments had given way, apparently as much from laceration as from absorption, and exposed a brain-like mass which appeared to be quite insulated from the surrounding parts. As the patient then very urgently demanded an operation for the removal of this diseased mass, I immmediately undertook it and executed it in the following manner:

An incision, about three and a-half inches in length, was made along the anterior edge of the mastoid muscle, by extending the ulcerated aperture in the skin upwards and downwards. The edges of this incision, which were quite loose and detached from the subjacent parts, were then dissected backwards and forwards, until the whole surface of the tumour was fairly exposed. It was then rendered evident that the morbid growth, which was quite soft and yielding, had originated from the very inner edge of the *mastoideus*, and had extended inwards to press upon the trachea, and backwards to become complicated with the important parts in that direction.

I first attempted to dissect out the entire mass by detaching it from the trachea and its muscles, from which it was separated by some condensed cellular substance; and I persevered in that attempt, till I came upon the left carotid artery, which pulsated violently against my fingers. Finding it impossible to continue the dissection in that direction, I next cut away the sternal head of the mastoideus muscle, in consequence of which the whole mass was immediately loosened and detached from the surrounding parts. In attempting to wrench it away from the subjacent vessels, however, the soft substance yielded under the pressure of my fingers, and a small portion of the tumour

was left at the bottom of a deep cavity among the most important and almost inaccessible parts of the whole body. The common carotid was situated on the inside, the subclavian artery, thoracic duct, and par vagum immediately below, and the great jugular vein was spread over the outer margin of the remaining mass. At the same time a considerable hemorrhage, which could not be checked by the use of ligatures or pressure, was taking place from almost every part of the exposed cavity.

What my feelings were at that juncture, I shall never be able to describe. On no other occasion did I ever feel, for a moment, disposed to abandon any undertaking which I had commenced with a reasonable prospect of success. But I persevered; and by dint of constant sponging with cool water, to check the hemorrhage, and of digging with the handle of a scalpel, and my index finger, I finally succeeded in getting away every particle of the diseased mass.

By steadily pressing a sponge wrung out of cold water into the cavity of the wound for a short time, the hemorrhage so far subsided as to present only a slight oozing of blood. After having pared away the ulcerated edges of skin I applied three interrupted sutures, and completed the dressing with lint and adhesive strips.

During the first three or four days after the operation, the patient was afflicted with a very distressing sensation of throbbing in his head. He was also troubled with severe and frequently repeated paroxysms of coughing, under the excitement of which blood occassionally came away in considerable quantities from the wound. Notwithstanding all these unfavourable symptoms, however, a free suppuration soon became established, and the cavity filled up with sound granulations which were completely cicatrized over in less than six weeks after the operation.

In the month of November last, Mr. S. again consulted me for the relief of what he supposed to be a return of the same

disease; and on examination I discovered a small tumour, of the size of a hazle-nut, in the upper portion of the cicatrix in his neck. I immediately laid this open with a lancet, and after squeezing out its pulpy, brain-like mass, I applied the lunar caustic with great freedom to the whole surface. The small ulcer which resulted was soon afterwards healed up; and the patient has since remained in apparent good health.

Case II.—In the month of January last, I was consulted by Mrs. Andrew Brown, of Pequea Valley, Lancaster County, on account of an enormous tumour on the right side of her neck. She first observed it in the year 1809, in the form of a small deep-seated lump, just beside the trachea, in the middle of the neck. It increased very slowly and without pain at first; but after the lapse of several years, she began to be alarmed by the great bulk which it had acquired, and the shooting pains which were experienced in it.

In the year 1820, she applied to an empiric, who undertook to destroy the tumour by escharotics; but the integuments had no sooner ulcerated, than the pains became so insupportable that she desisted from all further attempts in that way. She soon after applied to a surgeon of great eminence in this city, who at first proposed an operation, but afterwards declined it, on account, as he alleged, of "the strong pulse" in the tumour. From that time onwards, the tumour continued slowly to increase until I saw it, when it was fully as large as one of my fists. It was situated directly over the course of the common carotid, and covered almost the whole length of that vessel. There were two fluctuating prominences near the apex of this tumour, in which such an indistinctly thrilling sensation was perceptible, that the suspicion of an aneurism might easily have been entertained. Indeed the whole mass was sensibly agitated by every pulsation of the artery, and it was no easy matter to decide whether the vessel was enveloped in the tumour, or lay altogether beneath it. The trachea was considerably displaced towards the left; and

the sterno-mastoideus was elevated and pushed in the opposite direction by the tumour. In front was the cicatrix, produced in consequence of the former use of the escharotic application; but the integuments had contracted no adhesions to the surface of the tumour in that place, and appeared to be in every other respect perfectly sound.

On the very next day after I first saw Mrs. Brown, I extirpated the tumour in the following manner: The whole of the old cicatrix was first included between two curvilinear incisions, which met above near the angle of the jaw, and below close to the origin of the tendinous head of the sterno-mastoid muscle. After having freely dissected up the skin backwards and forwards, I next made an incision through the platisma myoides and external cervical fascia, and introducing one of my fingers underneath them, I tore them off from the subjacent surface to which they loosely adhered. The fibres of the omo-hyoideus were then discovered running obliquely across the centre of the tumour, to join the external fibres of the sterno thyroideus which were spread over its inner margin; and beneath all these appeared the internal or deep-seated cervical fascia, binding down the whole mass with great firmness. I proceeded to elevate these exactly as I did with the layers of the external fascia, except that I cut them up, with the point of my knife, directed by a finger underneath, all around the circumference of the tumour. In accomplishing this step of the operation a large branch of the superior thyroid artery, with its accompanying veins, was discovered running downwards into the upper part of the tumour. Instead of dividing this with the knife, I tore it away from the substance of the tumour with my fingers, and hardly a single drop of blood in consequence escaped.

The tumour was then easily separated from the surrounding parts, to which it was loosely attached by a lax cellular tissue. But it was not so easy to remove it from the subjacent artery and jugular vein, with which it proved to be

much more firmly connected. By pulling it, however, with one hand, and introducing the handle, and occasionally the point of my knife with the other, I finally succeeded in getting away the entire mass, without inflicting any other injury upon the important parts beneath, than the disturbance and laceration of their connecting cellular tissue would necessarily occasion.

The common carotid was left entirely exposed at the bottom of the wound, for almost the whole of its length, and the great jugular and par vagum were also quite insulated on its outer side. We then had a fine opportunity of observing the phenomena which so complete an exposure of a large artery to the influence of the air is calculated to produce. All the gentlemen who were present were surprised to find that it did not appear to pulsate, except when pressed by the point of a finger, or some other resisting body. They were much interested, also, with the fact, that it contracted very remarkably in the centre of the exposed part, so as to present an appearance somewhat like the shape of an hour-glass.

As no hemorrhage resulted from this operation, I did not find it necessary to employ a single ligature. I therefore closed the wound at once with three interrupted sutures, and some strips of adhesive plaster. The parts were found to have been fully re-united in five days after the operation, without the occurrence of any other troublesome symptom than a slight cough, and a pulsatory pain in the head.

On carefully examining the tumour after its extirpation, we ascertained that it was composed of a grayish medullary substance, enclosed in a dense fibrous capsule, with two large hydatiginous cysts projecting from its anterior surface.

If I were asked the question, in what structure this disease was first developed, I must confess that I should find it difficult to give a positive answer. Some will probably suppose that it originated in one of the deep-seated lymphatic glands;

while others, with an equally strong probability on their side, will ascribe it to a morbid enlargement of some of the granules of the lobe of the thyroid gland on the same side. In confirmation of the latter opinion, might be urged the fact, that no trace of the thyroid gland could be discovered on the side of the trachea which was laid bare during the operation, every portion of that lobe having been, in all probability, absorbed in consequence of the pressure exerted on it by the tumour.

That this was a case of specific disease, and not a mere enlargement of any of the natural structures, I trust no argument will be required to prove. The formation of the hydatids, and the appearance of the encysted substance itself, will satisfy the minds of every experienced surgeon on this head. I may state, also, in confirmation of this opinion, that some indications of a return of the disease have already been discovered. Mr. Brown lately called on me for advice respecting the treatment of "a small lump which," he said, "was growing on one side of the scar that followed the operation."

Case III.—Mrs. Wallace, a poor, but respectable woman in Franklin Court, applied to me, some time in the summer of 1824, with an ulcerated tumour in the left side of her throat. It had remained in an indolent, schirrhous state, of the size of a pullet's egg, for years; until, about six months before I saw her, it began to ulcerate. The ulceration had progressed very slowly, having produced only an irregular and superficial ulcer of the skin, with corrugated and inverted edges. Nothing but a very offensive ichorous discharge escaped from it; and no disposition to granulate had ever been evinced on its surface. Its situation was just below the angle of the jaw, and before the anterior edge of the sterno-mastoid muscle. Every pulsation of the subjacent arteries communicated a visible motion to it; and it beat violently, when pressed on by the fingers. Severe lancinating pains were frequently experienc-

ed shooting through it; and the health of the patient was rapidly declining. Soon after I saw Mrs. W., I therefore extirpated the tumour in the following manner.

Two curvilinear incisions, about three and a-half inches long, were made, upwards and downwards, so as to include the whole of the diseased part. These were both deepened until the platysma myoides, and external cervical fascia were cut through all around the tumour; after which the entire mass was easily removed by detaching its under surface from the sheath of the great vessels and nerve, to which it firmly adhered, with the handle of a scalpel. The point of the blade had to be used only once or twice in this part of the operation, for the purpose of dividing some tense fibrous bands which could not be broken by pushing against them with the handle. Only one vessel, the branch of the superior thyroideal artery, which crosses the carotid to be distributed to the mastoideus, was divided in this operation; and that was immediately secured by a ligature.

On examining the bottom of the wound, after the removal of the tumour, the common carotid for about one inch below its bifurcation, and its two great branches for about half an inch above the same point, together with the jugular vein and par vagum, were found to have been exposed, although they were partially concealed by a very thin layer of fascia. This fascia, however, had been entirely cut away directly over the bifurcation of the arteries, so that they were left exposed to the full influence of the air, as well as to the sight.

The exposed portion of the artery appeared, in this case, to pulsate violently, even when pressure was not made by the finger. This circumstance was, probably, owing to the slight degree of pressure which the uninjured parts of the deep-seated fascia must have made on the circulating column of blood.

As a large portion of the integument was removed along with the tumour in this operation, I found it impossible to draw the opposite edges of the wound into complete apposi-

tion, although I employed two interrupted sutures, and long strips of adhesive plaster. The process of cicatrization was, therefore, necessarily slow. It was about six weeks before I could pronounce the wound to be completely healed. For the first five days after the operation, this patient was afflicted, in the same manner as the two other cases which I have related, with a troublesome cough, and throbbing pain in the head.

In May 1825, Mrs. W. returned to me again for assistance. The upper portion of the cicatrix had become corrugated, and covered with a scaly desquamation; and another painful schirrhous tumour, of the size of a hickory-nut, had formed just below the situation of the former.

As one of my pupils was exceedingly anxious to try the effects of an escharotic powder, which his father, although a respectable physician, had formerly purchased of the celebrated empiric, Dr. Martin, I put the patient under his care. To my great gratification, in the course of a few days, a deep ulceration was produced over the surface of the tumour; and in less than two months, a complete destruction both of the schirrhous tumour and the diseased integument was effected; I examined this empirical remedy afterwards with great care; and, from its appearance, and other sensible properties, was induced to believe that it is chiefly composed of the powdered root of the orobanche virginiana.

The poor patient is by no means, however, perfectly cured of her horrible disease. She has lately called upon me with an enormous tumefaction of the periosteum of the sternum and clavicles; and she is also afflicted with a terrible, and almost incessant cough, which will no doubt speedily put an end to her unenviable existence.

ART. VII.—*A case in which a Schirrhous Enlargement of the whole of the Parotid Gland was successfully extirpated.* By GEORGE M'CLELLAN, M. D.

DURING the past winter, Mr. now Dr. John Graham, a well educated and very intelligent young surgeon from Dublin, attended the lectures of the medical faculty of Jefferson College, for the purpose of becoming a candidate for the degree of doctor of medicine in that institution. As his left eye, and indeed the whole of the left side of his face, was evidently distorted, and as he wore his shirt-collar uncommonly high, I always suspected the existence of some disease, which impaired the functions of the facial nerve of that side. But I was not aware of the nature of the irritating cause, until at the end of the session, he applied to me for the purpose of getting my advice in regard to the treatment of an enormous tumour in the situation of the left parotid gland.

On examining the diseased part, I was immediately struck with the appearance of a large and irregular cicatrix over the most prominent surface. On inquiring into the cause of this circumstance, I was informed that it proceeded from an ineffectual attempt previously made by an eminent surgeon of Dublin, to extirpate the tumour. The operator himself, and several other respectable surgeons and physicians, who were present at the operation, at that time, as Mr. Graham assured me, were very positive in the opinion that the disease was an enlargement of the whole parotid gland. All the other surgeons who had, after that period, examined the case, joined, as far as his recollection served, in the same opinion. The appearance of the tumour itself, and the symptoms which attended it at the time when I first saw it, also tended strongly to corroborate that conclusion. It must be supposed, therefore, that I was exceedingly cautious in giving any advice in favour of a repetition of the attempt to extirpate the tumour. But the patient himself, and he was by no means unfit to form

a judicious opinion, was very anxious to have me make one effort to relieve him. The diseased part had also become exceedingly painful; and his left eye-lids were permanently prevented from closing, in consequence of which the eye-ball was constantly affected with a very troublesome chronic inflammation. I had, moreover, long been prepossessed with an idea that the conglomerate glands are rarely, if ever totally diseased; and that surgeons had often mistaken enlargements of the conglobate glands of the cheek for diseases of the subjacent parotids, in which they may become imbedded in consequence of pressure and absorption.

Reflecting on all these circumstances, and indulging a faint hope that the operation would not prove so formidable as I had at first anticipated, at the same time that I was strongly incited by the solicitations of my unhappy patient, I finally determined to make at least an attempt to extract the tumour.

On the 27th of February, therefore, in presence of my friend professor Smith, and several of my pupils, I performed the operation in the following manner: Two curvilinear incisions were first made, from a little above the zygoma downwards, to meet about two and a-half inches below the angle of the jaw, in such a manner that nearly the whole of the old cicatrix was included between them. After having reflected the integuments from the surface of the tumour, I next dissected down to the zygoma and masseter muscle before, and to the cartilaginous tube of the ear, and mastoid process behind. As no impression had then been made upon the body of the tumour, and as I could dissect no farther in either of those directions, I immediately proceeded to burrow under the lower extremity of the mass. In endeavouring to accomplish that step in the operation, I was necessarily obliged to divide the posterior belly of the digastricus muscle; after which my fingers were at once admitted under the whole body of the tumour, and I was enabled to make effectual attempts to wrench it from its bed. Before I proceeded farther,

however, I insulated the continued trunk of the external carotid, just as it was entering the tumour, together with the descending veins, which accompanied it; and, instead of cutting them across in the usual manner, I tore them out from the body of the tumour, with a thumb and finger. My face and eyes were instantaneously deluged with a gush of blood; but before I could recover myself sufficiently to cast a ligature around the vessels, which I still commanded with my fingers, the hemorrhage altogether ceased, in consequence no doubt of the retraction and contraction of the lacerated extremity of the artery. I was then enabled to proceed with full deliberation; and, after powerful and repeated efforts at wrenching, aided by an occasional use of the knife to divide the strong bands of condensed cellular substance, and some of the fibres of the styloid muscles which adhered to the tumour, I finally succeeded in elevating the whole mass above the ramus of the jaw, and mastoid process. The trunk of the *portio dura*, very much enlarged in consequence of the previous irritation, was then seen emerging from under the mastoid process, and mounting over the posterior margin of the tumour to enter its substance near the anterior surface. The unnatural state of tension in which this exquisitely sensible nerve was then placed, produced such an agonizing degree of pain, that the sufferer was thrown into convulsions and syncope. I made all haste to divide the nerve,* therefore, and the patient was soon restored to his natural state of sensibility and apprehension. To complete the operation I had then nothing more to do than to separate the upper portion of the tumour from the zygoma, which I was compelled to effect by the scalpel, inasmuch as the layers of fascia were too strong to be lacerated. In this last step of the operation the main trunk of the temporal artery was necessarily cut, in consequence of

* As soon as this was done, the cells of the conjunctiva were instantaneously injected with extravasated blood.

which a profuse hemorrhage took place from the recurrent circulation. I was, therefore, obliged to apply a ligature, which was the only one employed during the whole operation. What became of the internal maxillary artery, I could not discover, although there can be no doubt that it was torn asunder in the act of wrenching the deep-seated portion of the tumour from behind the angle and ramus of the jaw.

In consequence of the fainty, and almost exhausted state in which the patient remained for some time after the operation, there was much less oozing of blood from the exposed surfaces than could have been anticipated. Our view of the parts composing the parietes of the wound, therefore, was not at all obstructed; and the anatomy of the whole could be almost as clearly pointed out, as in the dissected subject. The cavity of the wound was certainly the deepest and most frightful that I have ever seen in the living body. It appeared much larger at the bottom than on the surface; and its depth was full four and a-half inches from the skin to the walls of the pharynx, which was largely exposed at the bottom of the wound.

The styloid process, entirely bared, and even divested of a large proportion of its muscular fibres which had been torn away with the tumour, projected into the back and lower part of the wound. The internal carotid and jugular vein, together with the hypoglossal nerve, which were barely covered with some loose cellular tissue, formed the posterior parietes of the deep and expanded part of the cavity that was situated within the ramus of the jaw before, and the mastoid process behind. With a finger, introduced behind the ramus and angle of the jaw, could be felt the two pterygoidei muscles, which were completely exposed and projected into the cavity in that situation. In fact the tumour appeared to have projected into, and to have filled up every space into which the parotid itself could possibly have insinuated; and no vestige of any portion of that gland, either sound or morbid, could be discovered in any part of the exposed cavity.

As I was anxious to avoid, if possible, the use of ligatures around the lacerated extremities of the arteries which had been torn across during the operation, I waited some time to ascertain whether there would be any danger of hemorrhage. As nothing more took place, however, than a slow oozing of blood, which gradually coagulated, and filled up the cavity of the wound, I did not hesitate in depending on the external dressings alone. To prevent the edges from being reflected inwards, I first applied three interrupted sutures; after which some adhesive strips and a compress of lint were fastened on by a head-bandage.

For the first three days after this operation, the situation of my patient was truly alarming. The powers of his nervous system appeared to have been greatly shattered; and, notwithstanding the free use of opiates, the symptoms of constitutional irritation ran very high. The secretion of urine was almost entirely suppressed; and when, on the second day, the first few drops began to be discharged through his urethra, a severe and excruciating strangury came on. Spasmodic contractions, also, frequently took place in the muscles of the extremities; and a most distressing pervigilium, which no plan of treatment could, for all that length of time, counteract, rendered the prospect of his recovery still more uncertain.

But the most alarming of all his symptoms was the fact that, in the course of a few hours after the operation, he found it impossible to convey any thing into the esophagus. Whether this difficulty proceeded from mere nervous irritation, or, as I supposed, from a collapse of the parietes of the pharynx in consequence of its exposure, and the laceration of the stylo-pharyngeus muscle; or whether it was caused, as the patient himself imagined, by the pressure of the large coagulum, which was confined in the wound, upon the internal and membranous walls of the same cavity, it was not easy to decide. But it was certain, that not the smallest particle of any substance could, for the space of two days, be swallowed;

and when an attempt to drink any fluid was made, universal convulsions, precisely like those which occur in hydrophobia, immediately supervened.

By the use of opiate injections, however, and the application of warm stupes around the pelvis and abdomen, the distressing symptoms of strangury, and the spasmodic twitches of the muscles, first began to disappear. Soon afterwards, as I was preparing to inject some fluids down his esophagus by means of a stomach tube, the patient made a successful attempt at deglutition, which gradually became more easy, and, of course, less complicated with the convulsive actions. The young gentlemen who were in attendance, attributed this to the effects of a copious secondary hemorrhage which had, a short time previously, taken place from the wound in consequence of a severe spasm of the muscles about the throat.

Suppuration was very slow in taking place from the wound; but finally, after the use of a decoction of bark, and the application of large fermenting poultices, it became established and dissolved away the enormous coagulum. Before the cavity, which almost became converted into an abscess, could be evacuated, however, I was obliged to re-open the wound with the point of a bistoury. Granulations then speedily sprouted up, and completed the recovery of my fortunate patient.

The cicatrix, which has become very firm, is sunk into a deep hollow behind the angle of the jaw. But the countenance is by no means so much deformed as it was before the operation, especially as the part can now be easily covered from the observation of a by-stander. The paralysis of the muscles, and the distorted appearance of the eye are, moreover, greatly improved; and the situation of the patient, as regards the use of his jaw, and the power of moving his head, has become incomparably better. The following letter which I have just received from Dr. Graham, who is now established as a practitioner of medicine in the city of New-York, will serve

at least to show that he thinks himself amply compensated for all the pain and hazard he incurred by submitting to the operatin.

New-York, July 24th, 1826.

My Dear Sir,—In compliance with your request, I embrace the earliest moment of submitting to your knowledge, a second time, a concise account of the first operation and subsequent progress of the tumour. As far as I can recollect, the tumour commenced its growth when I was thirteen years old, and kept increasing imperceptibly until I was eighteen. At that time several physicians were consulted on the occasion; they all pronounced it to be a case of scrofula; leeching, cupping, blistering, &c. were all prescribed, but to no effect. In the year 1819, I went to Dublin, and consulted Mr. ******* who is considered a very eminent surgeon; he immediately pronounced it to be a case of medullary sarcoma, and prepared to extirpate it, explaining to me, however, the danger of the operation; observing, also, at the same time, that he thought the parotid gland was diseased, and if it was, he considered the operation would be unsuccessful. After a few days serious reflection I concluded to have the operation performed. Mr. *******, assisted by Drs. ******, *****, *******, and ******, commenced the operation on the 10th of March, 1819. An incision was made in the tumour from the lobe of the ear to the angle of the jaw; the integuments were then dissected off to the base of the tumour; when he began to burrow under the tumour with the scalpel, a profuse hemorrhage took place; he felt alarmed, and concluded with the other gentlemen, that it was incorporated with the branches of the external carotid. To satisfy himself as to the fact, he dissected a piece from the tumour, which he said confirmed his opinion as to its extreme vascularity. They all agreed on the impropriety of proceeding any farther, and determined to pass a seton through the tumour from the lobe of the ear to the angle of the jaw, for

the purpose of bringing on a suppuration; a seton was introduced, and powerful styptics applied to suppress the hemorrhage, which, notwithstanding, was very profuse. The inflammation became so very high on the second and third day that copious venesections were required, and on the fourth, no appearance of suppuration commencing, he determined to apply escharotics. The corrosive sublimate was applied, by which I suffered the most excruciating pain for six hours, and, in the course of twelve after its application, I was severely salivated. By poulticing, the dead portion began to separate in the course of a few days, without any diminution whatever in the size of the tumour.

In the same manner as described the corrosive sublimate was applied six or eight times in the course of six weeks, always followed by a profuse salivation; as soon as the dead portion was separated, there was an evident reproduction of the tumour. At this time my strength was almost exhausted and scarcely any hopes left of recovery. I sent for Mr. Carmichael who disapproved very much of the treatment I had received; he ordered the escharotics to be discontinued and poultices substituted, together with the compound decoction of sarsaparilla, promising at the same time to endeavour to extirpate the tumour, when the wound should be completely healed, and my strength admit of the operation. Under the treatment prescribed, in the course of one month the wound was completely healed, and my strength and appetite in a great measure restored. After that time the tumour was imperceptibly increasing, and when operated on by you was much larger than it ever was before. At present I am quite free from pain, and suffer no inconvenience from the operation, but a slight paralysis of the muscles of the side of the face.*

---

* Before the operation the muscles were affected with a neuralgic rigidity and distortion, from irritation of the nerve; now they are simply paralyzed in consequence of the destruction of the trunk of the *portio dura*.

Time and distance can never erase from my memory the important services you have rendered me. With sentiments of sincere esteem, attachment and friendship,

I am, Dear Sir,
your most obedient
and humble servant,

GEORGE M'CLELLAN, M. D. JOHN GRAHAM.

In describing the form of the tumour, which is now preserved in the museum of Jefferson College, I have only to observe that it is exactly adapted to the conformation of the wound that was left behind the jaw after its extraction. The part which originally projected outwardly upon the back of the cheek is distinctly separated, on its anterior surface, from the larger and deep-seated portion by a groove into which the posterior margin of the angle and ramus of the jaw had been received. The trunk of the *portio dura* is left, full one inch in length, entering into the posterior margin of the preparation, just underneath some strong layers of fascia which were dissected off from the mastoid process in the act of separating the tumour from its outward attachments. The whole mass is enveloped in a strong membranous capsule,—produced by the condensation of the surrounding cellular substance. This was ruptured, however, just beside the situation of the old cicatrix, in one of my severe attempts at wrenching away the deep seated portion of the tumour from behind the jaw, and some of its contents were forced out, very suddenly, with a crackling noise. On examining the internal conformation of the tumour, every one has been struck with the circumstance that it differs but very little from the appearance of the substance of a healthy parotid gland. The only difference which I can discover, even on a minute examination, is in the size, hardness, and colour of the granules, which are considerably larger, and more indurated than natural, at the same

time that they present a stained and reddish-yellow appearance. The description which Dr. Baillie has given, in his morbid anatomy, of that enlargement and induration of the pancreas which he imagines to be the precursor of true schirrhus in that gland, will afford a very good idea of the appearance to which I allude.

In conclusion, I will only observe that this diseased condition of the parotid gland rendered the facility of performing the operation much greater than that which would have attended a similar attempt in a healthy condition of the same part. Naturally the granules of all the conglomerate glands are but loosely connected together, so that, under any violent attempt at wrenching, they will sooner tear apart from each other than be removed entire from among the parts in which they may be lodged.

ART. VIII.—*Suture of the Palate.* By NATHAN SMITH, M. D. Prof. of Surgery, in Yale College.

THE effect of suture of the lip in partially closing the fissure of the palate, when this deformity exists together with hare-lip, some time since suggested to me the propriety of applying the suture, when the operation is performed at an early period, directly to the palate itself.

Every one must have observed that, when in early infancy the suture of the lip is properly made, the gentle pressure which the lip, then more straight than natural, exerts upon the cleft portions of the jaw, has a tendency gradually to approximate them, for at this time the bones of the face being yet in part cartilaginous, readily yield to little force.

Something more than a year since, in the state of Maine, a case occurred to me in which I judged it proper to attempt the more perfect closure of the palate by sutures applied directly to that part itself. I reflected that the parts must at that period (infancy) be so soft as to offer but little resistance

to the needle, and so yielding as to be brought, with little force, in close contact with each other. It appeared to me, also, that the closure of the lip would be much more complete by thus bringing the sides of the jaw into their natural situation with respect to each other.

The operation was accomplished with less difficulty than I had anticipated. The margins of the palate were pared with the knife, and a ligature of suitable size, with a needle very much curved, was carried through on one side, a sufficient distance from the margin, and brought back through the opposite. Two threads were employed in this manner, and the parts were brought into contact with very little difficulty. I have not since seen the patient but have reason to believe that the operation was perfectly effectual.

I have since seen an account of a similar operation performed by an English surgeon.

ART. IX.—*Three cases in which operations for securing the common Carotid Artery have lately been performed.* By GEORGE M'CLELLAN, M. D.

IN the months of May and June last, I performed three operations for securing the common carotid artery.

CASE I,—Was a little daughter of Mr. West of Bristol, aged nine years, with an enormous *aneurism by anastomosis;* which, covering the whole of the left cheek, extended from the temple and eye of the same side to within two inches of the clavicle, and from the tube of the ear, which it filled, to the nose and mouth. The left nostril was closed by the disease; the tongue, soft arches of the palate, and tonsil of the same side, together with both lips, were also invaded by it and distended to an enormous size. The integuments were very thin and discoloured from the appearance of the diseased vessels underneath; and the whole mass pulsated actively and tumefied, whenever the patient was excited. The difficulty in performing this operation was very great, owing to

the extension of the disease down the neck; but the common carotid was notwithstanding secured by a single ligature opposite the lower end of the thyroid gland. The ligature came away in fourteen days, and the tumour has since been gradually diminishing. It has already left the throat, ear, nose, and upper part of the cheek.

Case II,—Was a lad sixteen years old, in York, Pennsylvania. He had been thrown from a horse, three years ago, when he fell upon the right side of his head and received a severe concussion. He was afterwards afflicted with epileptic attacks; and, about twelve months ago, the left side of his body began to be paralyzed. At the same time a hard tumour was discovered, just above the right ear, which continued to increase ever after. Most excruciating pains were unremittingly experienced in the situation of this tumour, and no relief could ever be obtained from the most active mode of treatment. The scalp was first divided, and carefully dissected from the surface of the tumour; when it was ascertained that a large and vascular fungus had begun to protrude through the bone in two separate points. This, no doubt, proceeded from the subjacent surface of the *dura mater;* and, as the meningeal artery of that part holds but few anastomoses with the surrounding vessels, it appeared reasonable to suppose that relief might be obtained by obstructing the circulation through that side of the head. The right carotid artery was therefore secured by two ligatures just below its bifurcation; and the wounds were dressed in the ordinary way. In about two weeks the ligatures came away spontaneously, and the patient was walking the streets. The tumour had diminished very much in seven days after the operation, and since that time has still further decreased. Dr. Macilvain writes that "the patient has remained entirely free from pain ever since the operation," "that his general health is greatly improved," and that "the paralysis is regularly diminishing."

Case III,—Was the daughter of Mr. J. Fryburg, of Spring Garden, five years old. When she was six months old a

small and discoloured tumefaction was discovered in her left eye-lids, which continued to increase ever after, notwithstanding the use of leeches, low diet, lead water compresses, &c. In the month of May last, it had filled the whole orbit, so as to protrude the eye very much, and to tumefy the lids exceedingly. It was subject to alternate "risings and fallings," as the parents observed, during which the eye-ball would project and retire in a remarkable manner.

On pressing on the lids, the whole of the contents of the orbit could be felt pulsating, or rather rolling like a mass of small worms, so that no doubt respecting the nature of the disease could exist. It was evidently an aneurism by anastomosis of an active character. On the 10th of June, I therefore exposed the left carotid just below its bifurcation, which in this case was nearly one inch lower than natural, and tied it with a single ligature. The patient, although very unruly, did well; and on the fourteenth day the ligature came away. The tumefaction of the lids has now almost disappeared, except at the inner corner of the lower lid, where it covers the lachrymal sac. The globe of the eye has also retired into the orbit almost to its natural depth; and no pulsatory movements can ever be discovered under the pressure of the fingers.

Of the difficulties which I encountered in performing the first and third of these operations no one who was not actually present with me, can ever form an adequate idea. A child cannot be prevented from attempting to cry, from holding in the breath, and from contracting the muscles of the neck violently when the head is confined by assistants,—all of which circumstances prove, to say the least, exceedingly embarrassing to the operator. On examining the records of all the cases to which I can gain access, I have been surprised to find that no surgeon has heretofore attempted to perform the same operation on a child. The youngest patient on record is mentioned in one of Dr. Mott's cases, in which the young lady was nineteen years old.

QUARTERLY HISTORY

OF

IMPROVEMENTS IN MEDICINE, SURGERY, &c.

PHYSIOLOGY.

1. *Report made by M. Magendie to the Academy of Sciences (at their meeting, July, 1825,) on the subject of a Boy, named Honore Trezel, Deaf and Dumb from his Birth, who obtained Speech and Hearing under the care of Dr. Deleau, jun.* (From the *Edinburgh Journal of Medical Science*, No. ii.)—At the sitting of the 10th of May, 1824, M. Percy made known to the academy that a deaf and dumb boy, named Trezel, had lately acquired hearing under the care of M. Deleau. The success had been as complete as could be desired. The child, who before the operation was entirely deaf, had been enabled to hear all descriptions of noise, and even to notice certain intonations of the voice.

But Trezel was, notwithstanding, far from having acquired the knowledge of sounds, though he enjoyed the faculty of hearing. An immense interval still separated him from children of his own age, who were possessed of a good organization. Noises of all kinds, the accent of the voice, the words which were addressed to him, as well as those which he endeavoured to form in his larynx, were only to him a source of new sensations, which delighted him; but he drew no other use from them. He was ignorant of the great advantages of language, and perfectly unaware that the vague and strange sounds that he sometimes produced with his vocal organ, might be the means one day of enabling him to express his wants and his thoughts. A melancholy experience has, in other instances, shown that if such a deaf and dumb patient, under these circumstances, be merely left to the care of his family, his sense and his intelligence will remain in a state which is not much superior to that in which he found himself before his cure had been completed. As soon, therefore, as Honore Trezel had obtained the faculty of hearing, such an education was required as might be a substitute for that which his infirmity had prevented him from receiving, and which

should enable him to avail himself of the sense that he had just recovered so happily. At the meeting in which M. Percy announced the result of the operation performed upon the young Trezel, he added, that M. Deleau was engaged in the instruction of this child, and that he would make known the result of it to the academy. M. Deleau has kept his promise.—Trezel was presented to you in one of your last sittings. He repeated from memory the fable of the Fox and the Crow, performed different exercises of analysis; and you have been enabled to judge yourselves of the state of his hearing, of his voice, and of his degree of intelligence, after nine months of assiduous care. This fact is so much the more important, as none of the deaf and dumb who have obtained the faculty of hearing by an operation, or who have acquired it spontaneously, have been observed a sufficient length of time by men of information, who could inform us what change had been effected in them, by a new sense intervening all at once in the midst of senses already tried; or who could make known what alterations have taken place in the intelligence, the instinct, the speech, or the motions of such individuals, by the development of a function so important as that of hearing; or, lastly, who could acquaint us whether a person born deaf and dumb, and who has acquired a hearing, is capable of entering into all the relations of social life, or whether he is not apt to step out of their bounds. It is evident that many interesting physiological questions connect themselves with the treatment of M. Deleau; and for this reason commissioners were appointed by you, who have considered it their duty to collect and verify all the circumstances of the case. What I am going to relate is an abstract of the report made on the occasion.

Claude Honore Trezel, now ten years of age, born at Paris, of poor parents, was of that class of the deaf and dumb who did not even hear the most violent noises, or the loudest explosions. His forehead was large, and his head well made; but his physiognomy, the image of his intelligence, had little expression. He dragged his feet in walking; his gait was tottering; he did not know how to blow his nose; and had, in other respects, received no education adapted to his situation. He made his principal wants known by a definite number of signs.

The operation which was performed was not a new one; it was invented towards the end of the last century by a deaf person of Versailles, who, fatigued with his situation, succeeded in curing himself. It is now adopted by all physicians who treat disorders of the ear; it has, above all, been frequently employed in practice by Dr. Itard. It consists in injections of air, or of different liquids, into the drum of the tympanum, by the tube which ends in the back part of the mouth. It has many serious

inconveniences, which happily did not present themselves in the case of young Trezel.*

The days which immediately followed an accession of hearing, were for Honore a period of rapture. The noises which he heard gave him ineffable pleasure; he sought them with avidity; on hearing a musical snuff-box he was in a sort of extasy. But there was a certain time required before he could perceive that speech was a medium of communication; besides, he attended at first not merely to the sounds which were formed, but to the movements of the lips by which they were accompanied; and thus he believed, during some days, that a child seven months old spoke like grown-up persons, merely because he saw his lips make movements. But he was soon taught his error; and he was aware from that time that it was to the sounds he should attach importance, and not to the motions of the lips.

But it unfortunately happened that he heard a magpie pronounce some phrases. In generalising on this particular fact, he concluded that all animals were gifted with speech, and consequently was anxious to oblige a dog to speak, of which he was very fond. He even resorted to violence to make him say *papa, du pain*, the only words that he could himself yet pronounce; but the cries of the poor animal terrified him, and he desisted from his attempt.

These first periods of hearing produced a great change in the physical state of Trezel. His gait became more firm; the mournful expression of his face was changed into a smiling and gay air; he learned to blow his nose, and ceased to drag his feet in walking.

A month had passed away, and Honore remained nearly at the same point. Absorbed by his sensations and his new remarks, he could not comprehend the different syllables which formed words; and nearly three months were necessary before he could distinguish some compound words, before he could know their sense, and that of short and simple syllables.

It was likewise a length of time before he knew the direction of sound. A person having concealed himself in the room where the boy was employed, called out to him, but it was with considerable difficulty Trezel discovered the hiding-place of the individual who hailed him; and this discovery was much more

---

* It has been explained, in a separate work published on this case, that injections of water, by means of a small flexible sound, were forced into both the Eustachian tubes. These injections were not either accompanied by those dreadful pains which sometimes determine fainting, and oblige the treatment to be suspended, or followed by abscess and suppuration in the drum, which resist all hope of cure.

owing to the eye, and to the reasoning at which he had arrived, than to the employment of the ear.

All the interest, however, which Honore felt in the sensations procured him by his hearing, had not prevented him from making one observation of the greatest importance,—his larynx formed sounds; and to the pleasure of hearing them was superadded that of being able to produce them. It was in this that Trezel's case displayed the most curious and the newest phenomena.

The instrument of the voice is composed of a great number of different parts, among which are found muscles, bones, cartilages and membranes; consequently, it would have been wonderful if, without some preparatory exercise, all these parts, all these organs, had acted at once in concert, so as to produce vocal sounds and appreciable articulation: this, as we ought to expect, did not happen. The first sounds that Trezel was enabled to utter were dull and heavy; he pronounced, not without difficulty, A, O, U. The two other vowels came much later; and the first words that he formed were *papa, tabac, de feu, &c.* But, when he wished to repeat more complicated words, he made a multitude of contortions of the lips, of the tongue, and of all the agents of pronunciation, of the use of which he was entirely ignorant, resembling, in this respect, a person who begins to learn the art of dancing or swimming, and who exhausts himself in useless efforts and ungraceful movements.

But, induced by temptations, he acquired the pronunciation of some compound words, which had at first been beyond his abilities.

It was at the moment of making this attainment, that he conceived himself on a level with other children of his own age. Satisfied with himself, therefore, and proud of his new situation, he treated his old companions in misfortune with great disdain, and wished to see them no more. Few persons who had seen him at this time would have discovered in him a happy disposition.

But, notwithstanding this little emotion of vanity, Trezel advanced slowly in pronunciation. He left out a great number of syllables, or rather he articulated them in a very defective manner. Perhaps he never would have overcome this difficulty, if recourse had been merely had to his organs of hearing, but an appeal was likewise made to the sight. Different syllables were delineated for him, and from this moment he pronounced them much better, comprehending with much more clearness the assemblage of vowels and consonants, and the reciprocal influence which these exert upon each other. Thus a very remarkable fact was proved,—namely, that the association of the sight with the movements of the larynx was prompt and easy, while that of the hearing and of the organ of the voice was always difficult,

and was only exercised with slowness. For example, as soon as Honore perceived written syllables he pronounced them, if at the same time they were reverberated close to him; but, if the table on which the letters were traced was carried away, in vain were certain syllables articulated in his ear in the most distinct manner possible; to articulate them himself was an impossibility. He comprehended much more easily the affinity of sounds to written letters, than to the action of his larynx.

By constantly adhering to this mode of proceeding, Trezel has learned to read and write with sufficient rapidity, but after a manner which is similar to that of persons who learn a strange language, and who, in general, read it and write it long before they can speak it. Up to the present moment, Honore reads with his eyes, and writes infinitely better than he speaks.

His pronunciation is very defective. The Rs in particular rumble in his mouth in a most singular and disagreeable manner. The different varieties of accent seem unknown to him; but, when we consider the point from which he set out, we ought to be fully satisfied to see in him the degree of instruction which he displays in so short a time.

Honore exhibits another phenomenon, which has excited the attention of the commissioners of the academy. When a word is said distinctly to him, he repeats it immediately; when he is hailed, for instance, he does not fail to pronounce his name; it only appears of consequence to him to reproduce the word which he may have just heard. If his instructor would wish to address himself to his mind, he employs for the purpose gestures or expressions of the countenance. It is by signs only that the youth expresses himself with ease and quickness, and it is only by the employment of these signs that a judgment can be formed of his intelligence, and of the quickness of his conceptions.

In this point of view, Honore presents a phenomenon highly interesting. Having acquired a new medium for the expression of his ideas, it might be supposed that he would have neglected the method, so greatly inferior to speech, of which, until then, he had availed himself. But, up to the present time, the contrary has happened; his natural language, namely, that of signs, instead of being lost and gradually replaced by speech, has rapidly improved, and acquired a perfection and quickness much superior to that which it displayed before he had recovered his hearing.

However, in his connexions with children of his own age, Honore begins to employ simple words, and parlicularly substantives, to make known his principal desires. Perhaps the time may arrive when he will make a more frequent and complete use of speech; but in this respect it is possible that he may always remain far below other men. For we have nume-

rous examples of children who may be called dumb, only because there requires in them a certain effort of the ear to comprehend words, and rather a difficult exertion of the larynx to speak. Finding, by the employment of signs, an easy medium of communication, they neglect to exercise the ear and the organs of speech, and thus remain classed among the deaf and dumb, when in reality they are neither dumb nor deaf.

But to return from this digression.—Honore Trezel, who had been completely deaf, even to such a degree that a year ago he did not hear the loudest detonations, now listens attentively to all noises, knows when they come from afar off, distinguishes their character, avoids carriages and horses, and goes to open a door when any person knocks. He knows how to appreciate the musical rhythm, and takes pleasure in listening to singing and musical instruments; he tries even to imitate the modulated voice, without, however, having been yet able to succeed. He knows how to appreciate and repeat all the articulations of our language; he comprehends, he analyses, repeats from memory a certain number of phrases within his capacity, and he replies to them. He executes what his instructor by words directs him, but with other persons he is not yet able to do this; for the same reason that we comprehend a foreigner when we are accustomed to his pronunciation, and for the same reason that we are entirely incapable of comprehending him when he speaks to us for the first time.

Here are assuredly results sufficiently gratifying. When we take into consideration all that this child has learned before arriving at his present condition, as well as all the ideas and new combinations of them which have been indebted for their operations in his mind to the instinctive associations which have been established between his ear and his intelligence,—between these, again, and the organs of the voice,—between his ear and his larynx, we have no difficulty in flattering ourselves with the hope that his moral condition and his physical state will continue to improve.

But let us not anticipate the future; let us rather wait the result of experience, which in this, as in all new questions, can alone enlighten us.

Your commissioners think that the efforts of M. Deleau to impart the blessings of social life to beings who, in a great degree, had been separated from it by nature, are deserving of the eulogium of the academy; that the results at which he has arrived in the young Trezel, are very important and worthy of the most lively interest. They propose to you to engage M. Deleau to continue the education that he has so happily begun; to multiply, as much as possible, observations of the same kind; and thus to lay the foundation of a species of instruction or educa-

tion, which ought to be esteemed among the number that meliorate the condition of the human race.—(*London Medical and Physical Journal.*

(*Signed*) DUMERIL,
GEOFFRY ST. HILAIRE,
MAGENDIE, *Reporter.*

COLLECTANEA MEDICA.

2. *An Account of the present state of Medicine in Italy.* By FR. W. OPPENHEIM, M. D. (From the *Edinburgh Medical and Surgical Journal*, Nos. lxxxvi. lxxxvii.)—The above is the title of an article in a late number of the Magazine of Foreign Literature, an excellent medical work, edited in Hamburgh, by Dr. GERSON and Dr. JULIUS. It contains much interesting matter, from which we have made a selection, calculated to give a correct idea of the state of medical science in Italy, and to serve as a guide to those who visit that country for the purpose of adding to their stock of professional information.

Our author describes the institutions of the Italian states, according to the order in which he visited them, beginning with the kingdom of Sardinia, in which there are two universities, one at Genoa and one at Turin.

In the Genoese university ten professors are employed in teaching the different branches of medicine and surgery. None of these professors, however, enjoy much celebrity; practical anatomy is shamefully neglected, and there is no anatomical museum. The languishing state of science, in this university, is attributed by our author to its being under the direction of the Jesuits, who are in possession of its revenues, and expend considerable sums upon the purchase of theological books, while they almost entirely neglect, or give but little encouragement to, the cultivation of natural history, comparative anatomy, and the other departments of medical education. During the short-lived constitution of thirty days, the students ranked themselves on the side of the anti-royalists, in consequence of which the university was closed for three months, upon the return and restoration of the king.

The population of Genoa amounts to 90,000. It has two civil and one military hospital, besides a work-house.

The *Ospedale Pammatone* is very large, and externally resembles a palace more than a hospital. Its pillars, stairs, and balustrades, all of Carrara marble, lead the stranger to expect a commodious interior. But here he is miserably disappointed, and finds a total want of every thing suited to promote the health

or comfort of the patients. The wards are very spacious, but badly lighted, imperfectly ventilated, and extremely filthy. The floors are made of tiles, half worn out, and scarcely ever cleaned. The bedsteads are of iron, have no curtains, and are ranged in three rows, two of which are so close to each other that they touch.

The patients are attended by nuns, belonging to the order of Nostra Donna del Rifugio. Three physicians and four surgeons are attached to this institution, which has 1600 beds, but is capable of containing 4000. When our author visited it, 1824, the number of patients amounted only to 826. Post-mortem examinations are here very rare, and the anatomical cabinet consequently very poor, containing only about a dozen dried preparations, and one skeleton! In 1821 the admissions amounted to 9344; the proportion of deaths to recoveries, as one to six.

Spedale degli Incurabili, is a handsome but badly situated building, containing 1000 beds, and destined for the reception of the aged, the poor, and the insane. Patients of the latter description occupy a separate wing of the building. Their wards are spacious, but here again we meet with three rows of beds; and our feelings revolt at the situation of these wretched beings, the greater number of whom are chained hand and foot to their iron bedsteads! where such a mode of coercion is employed,—where the strait waistcoat is unknown,—where the physicians, Drs. Isola and Timoni, (we wish not to conceal their names,) hurry daily through this abobe of misery, without giving a single direction to the nurse-tenders concerning the treatment of the patients, can we wonder that a cure is scarcely ever effected? We are sorry to find that, disgusting as such a scene must be, it is even surpassed in an asylum at Vienna, where Dr. Oppenheim has seen the lunatics not only chained but caged, like beasts in a menagerie!

We feel particularly anxious that such a state of things should not exist unknown, and consequently unredressed. What Dr. Oppenheim has already disclosed to our professional brethren in Germany, we think it our duty to publish in Great Britain, in the hopes of thereby contributing to promote a reformation in the treatment of lunatics in Italy: the first step to a reformation being to attract public attention to the extent and nature of the abuse. While we feel it our duty to record this barbarous treatment of lunatics in one of the first cities in Italy, we are yet far from wishing to stigmatise the Italian character as inhumane, or their physicians in general as ignorant; for we ourselves recollect the existence, and that at no very distant period, of abuses not less enormous in Great Britain.

Dr. Oppenheim is doubtful whether to attribute to absolute want, or a degraded state of national character, the alms-beg-

ging which prevails in the Italian hospitals. "As I passed each bed," he observes, "its sickly tenant stretched forth his meagre arms to implore for charity!"

Albergo dei Poveri, a splendid building, adorned with costly architectural ornaments, but deficient in more essential qualities. It contains 2000 persons, consisting of the poor, the aged, and many orphans. The internal management of this institution is much better than that of those already described. The paupers and orphans appeared clean, well clothed, and well fed.

In Genoa there are also a military hospital, containing 800 beds, and an institution for the instruction of the deaf and dumb. The latter was founded in 1801, by the Abbe Octavius Assarotti, who still presides over it, and pursues nearly the same mode of instruction as is usual in France. In Italy, as elsewhere, this malady has been observed to be much more frequent among the poor than among the rich. The state of this institution, which contains twenty boys and twelve girls, is highly creditable to the Abbe.

Turin, for a population of 80,000, has four civil hospitals. That of *S. Giovanni* is the largest, being capable of containing 600 patients; but, at the time of Dr. Oppenheim's visit, there were not more than 200 in it. The wards are large and well ventilated. The proportion of deaths to recoveries, out of 4557 patients admitted in 1821, was as one to seven. There is a clinical ward in this hospital, containing twenty beds.

Casa dei Pazzi contained 260 lunatics, of whom more than one-third were chained. Their situation seemed even more deplorable than that of their fellow sufferers at Genoa. Although there are three physicians and three surgeons attached to this asylum, yet Dr. Oppenheim could not discover that any curative measures were ever employed.

The university of Turin has eleven medical and surgical professors. The number of medical students generally amounts to nearly 100. The medical practitioners of the kingdom of Sardinia are much divided as to the systems they pursue. The juniors, who have studied in Paris adhere in general to the doctrines of Broussais. Some of the seniors are still Brunonians; and, what is singular, the younger Rasori has fewer followers than might be expected.

The grand Duchy of Tuscany has one university at Pisa, and three medical academies, viz. at Florenz, Pistoia, and Sienna. In order to obtain a license to practise, the student must not only have attended an hospital in one of the above towns for seven years, but must have practised during that period under the direction of the clinical professor, and must finally submit to an examination. Even those who have taken the regular academical degree of M. D. elsewhere, must attend one of the Tus-

can hospitals for two years, before he is allowed to enter on private practice.

The academies at Pistoia and Sienna are too inconsiderable to claim attention. Our author therefore passes at once to the university of Pisa, which has nine medical and surgical professors. There is here, however, no school for teaching midwifery.

The university building is small and inconvenient; and contains a few lecture rooms, besides an anatomical and surgical theatre; but the latter is so badly lighted, that most of the operations are performed in the former.

The medical courses commence in November, and conclude in August. The students of medicine amount to about two hundred, of whom many are Greeks. Dr. Oppenheim had an opportunity of hearing one of the lectures on anatomy, and declares it was the worst he ever heard.

We shall give our author's account of the medical institutions at Pisa in his own words:—

"*Ospedale Santa Chiara è Casa de Trovatelli* contains 300 patients; the wards are clean, spacious and lofty. The medical and surgical patients, in this as in the other Italian hospitals, are not separated from each other, but lie in the same ward. There is a clinical ward, with twelve beds, for the treatment of medical cases, under the direction of professor Morelli; besides one for surgical cases, under the direction of professor Vacca Berlinghieri. The attention of these professors is not, however, confined to the clinical patients, for they make remarks upon every interesting case in the hospital. The surgeon's visit is made at seven in the morning, and the physician's at ten. The hospital pupils here, as in all the other Tuscan schools, wear a particular uniform, consisting of a red surtout and a white apron: as the domestics of the hospital are similarly dressed, they are scarcely distinguishable from the students.

"Professor Vacca Berlinghieri is extremely polite to strangers, and is very communicative upon professional subjects. I shall relate what I saw and heard while in his company. His method of lithotomy* is well known, from his three Memoirs on that subject. His success has undoubtedly been considerable; for, of twenty-nine patients upon whom he has operated, he has lost but two; and, of these, one was more than sixty-four years old. I saw two persons upon whom he had operated; one was a boy, four years old, who had been cut for the stone five days before. He seemed to be doing well, the greater part of his

* He opens into the bladder from the rectum.

urine being already voided through the urethra, while the wound was beginning to heal. The other was a very melancholy case of a young man, on whom the operation had been performed fourteen weeks previously to my visit. The stone had been broken in the first attempt to extract it, and the fragments were successively removed, great care being taken by the professor to leave no part of it in the bladder. He used injections and every other usual precaution; but nevertheless, and although the wound had assumed an healthy appearance, the patient complained of calculus pains on the twelfth day, when the professor discovered another piece of the stone in the bladder. In removing this he made no new incision, but merely dilated the original wound with his finger. This fresh irritation caused a violent inflammation of the parts, and the swollen part of the rectum, which had performed the office of a valve in preventing the fæces from entering the bladder, sloughed away, so that a fistulous opening was formed between the rectum and the bladder, and the urine was consequently evacuated partly per anum, and partly through a catheter introduced into the urethra. When the catheter was introduced only as far as the neck of the bladder, the urine flowing through it was mixed with fæcal matter: but, when it was pushed higher towards the fundus, the urine was natural. When I saw the patient he was less hectic than he had been, but still the fistulous opening into the rectum remained; its calibre was, however, diminished.

When this operation had been revived in France, by Sanson, and improved in Italy by Vacca, who merely makes an incision into the neck of the bladder, it excited much attention, and was practised by many French and Italian surgeons with considerable success. Scarpa, however, urged many objections against its safety, the most important of which was the danger of wounding the vesiculæ seminales. To this Vacca replied, by stating that, of eighty patients thus operated on, none had felt a diminution of their sexual powers. It is very remarkable that so celebrated a surgeon as Dupuytren should have so suddenly changed his opinion concerning the propriety of this operation. He now declares himself decidedly hostile to it, and yet, when I was in Paris in 1823, he was quite enthusiastic in its favour; for I heard him say, that the number of patients who suffer from a fistula after this operation, was not greater than that of those who died after any other!

"Calculous complaints are very rare in the neighbourhood of Pisa, and the majority of the cases operated on by Vacca come from Bologna, Genoa, and the Piedmontese countries, whose population subsist almost entirely on vegetable nutriment; a fact proving that the formation of stone does not depend upon a superabundance of nitrogen.

"Diseases of the large arteries are so unfrequent at Pisa, that there had been no operation there for aneurism during ten years."

Dr. Oppenheim, however, saw at Pisa one case of popliteal aneurism in a healthy man. It is singular that Vacca refused in this case to perform the operation; alleging as a reason, that he believed the patient's blood possessed too little *plasticity*,* and the arterial coats had too much inclination to suffer from distention or rupture, to authorize a reasonable hope of successful termination. He could not assign any intelligible grounds for this opinion, which was, however, justified by the event; for another surgeon having performed the operation, hemorrhage took place on the third day, which was stopped by tying the femoral artery above the origin of the profunda. This resource proved also ineffectual; for a fresh hermorrhage occurred in three days after, and the patient died.

Dissection showed that all the coats of the artery had been divided by the ligatures, while no sufficient coagulum had been formed, and no attempt made towards the exudation of coagulable lymph.

What symptoms Vacca conceived to contra-indicate the operation in this case, we, as well as Dr. Oppenheim, are unable to guess:

"Fistula lachrymalis is a very frequent disease at Pavia, and Vacca has observed it occur in women more frequently than in men, in the proportion of seven to one. His operation consists in making an opening into the sac, with a small straight bistoury; he afterwards widens the sac with a fine silver probe, and introduces into the duct a bit of extremely fine catgut, having a silk thread fastened to its upper extremity, by means of which it is secured above. In the course of a few days, the lower end of the catgut is forced through the nostrils by blowing the nose; it is then drawn down and detached from the silk thread, to which he fixes a small dossil of charpie, and is thus enabled to introduce the latter, from below upwards, into the lachrymal sac. The advantage of this method is, that the dossil being introduced into the sac through the lower opening, the superior external opening need not be enlarged or stretched so as to render it liable to inflammation. Vacca insists upon the necessity of dividing the tendon of the orbicularis muscle in this operation, as a portion of the sac lies directly under this muscle, and of course cannot be touched with the necessary escharotics; and, if this be not done, he contends that this portion of the sac will remain in a state of inflammation, and will occasion a relapse of the dis-

* The probable meaning of this expression is, that the blood was deficient in coagulable lymph.

case. In my opinion, the division of this tendon cannot be effected, without danger of also dividing the lachrymal duct.

"One of the most interesting cases I saw at Pisa, was an emphysema caused by fracture of the ribs on the right side of the thorax, together with injury of the pleura and lung, but without any external wound. The patient was brought to the hospital five days after the accident, when the emphysema was excessive, and had extended over the entire of neck, chest, abdomen, and scrotum. The patient felt very little pain, and was quite free from the usual symptoms, cough and expectoration of blood. He could lie on either side, but preferred lying on the uninjured side. His respiration was free, and he could make a deep inspiration without its causing uneasiness. The transverse fracture of the rib was quite evident on examination. This case is certainly extremely interesting, and seems inexplicable. Under other circumstances, it would have been necessary to make an immediate incision, but Vacca merely applied a few leeches, and the disease disappeared gradually.

"I saw here also a case of peculiar induration of the mammary glands, in a strong healthy woman, aged thirty, who had been but a few days in the hospital. Both breasts were equally affected, and were of a stony hardness; the indurated glands were movable, and the skin immediately covering them was very red, while in every other part of the breast it was quite natural as to colour. The temperature of the affected parts was elevated, and the nipples (as it were) pressed inwards. The woman said that the disease had commenced suddenly, and without any assignable cause, about seven years before, since which it had remained in the same state.

"In every other respect she felt herself remarkably well, did not feel any pain whatsoever in the breasts, and had no disorder of the digestive organs. There was no suspicion of syphilis, and the malady bore not the least resemblance to schirrus; for *both* of the mammary glands were attacked at the same time, their temperature was increased, and the skin red. This disease, too, had remained nearly stationary from the time of its first origin; and in its form the swelling did not at all resemble schirrus, being destitute of the notty elevations and inequalities so peculiar to that affection. The axillary glands were quite healthy.

"Vacca treated this disease as a case of chronic inflammation. He commenced with a venesection, the woman's constitution being very strong; and he afterwards applied leeches to the part, and cloths moistened with aqua laurocerasi. I saw this treatment continued for three days, without effect.

"The operation of trepanning, which I never saw performed in France, and but once in England, during a very diligent attendance on the hospitals in both these countries, is by no means

of rare occurrence at Pavia. Neither are its results, on the whole, unfavourable. In two cases, a perforation was made through the mastoid process, for the purpose of giving exit to matter formed in its cells, in consequence of otitis.

"Vacca has lately abandoned an operation he was formerly in the habit of performing frequently; I mean tying the saphena vein in cases of varix and varicose ulcers. The success of this practice was for a time considerable, but cases afterwards occurred in which dangerous symptoms were occasioned, such as violent inflammation of the vein. In a few instances this inflammation proved fatal."

Dr. Oppenheim observes, that an operation occasionally attended with such dangerous consequences, ought never to be undertaken for the relief of a complaint in itself destitute of danger.

We subscribe most willingly to this opinion, having ourselves learned from an extensive experience the uncertain issue of tying the saphena vein. One case we shall not easily forget. A young person, otherwise enjoying perfect health, was admitted into an hospital in order to undergo this operation. It was performed. Inflammation of the venous system supervened, and the patient died in a few days. For further information on this subject, see Hodgson on Diseases of the Veins and Arteries; Mr. Carmichael on Varix and Venous Inflammation; Dublin Hospital Reports, vol. ii.; and an excellent article on *Varices*, in the Dictionnaire des Sciences Medicales.

Florence.—Population, 80,000.

There are two hospitals, besides a foundling hospital.

1. *Spedale de Santa Maria Nuova,* capable of containing twelve hundred patients, but Dr. Oppenheim found in it only six hundred in April, 1824. The wards are large and lofty. The lower wards are in the form of a cross, and contain from one hundred and fifty to two hundred beds. They are badly ventilated, and uncleanly. Six physicians and six surgeons are attached to this institution, and attend in rotation, each for one month. Dr. Oppenheim blames this practice, as subjecting the patients to a constant change of treatment. The clinical wards of this hospital contains fifty beds; and, what is remarkable, almost all the operations are performed by the pupils,—of course, however, in the presence of the professors. Dr. Oppenheim saw here many cases of compound fracture, which were treated according to Dupuytren's method. He saw a case of medullary sarcoma affecting the testicles: castration was performed, but in five days a new fungous growth began to arise from the wound.

"Another melancholy picture was presented, by a case of fungus of the antrum highmorianum, which had forced its way into the mouth. Indeed, I do not think I ever witnessed an hospital containing so many desperate diseases, such as hopeless

cases of morbus coxarius, cancer, and abscesses, attended with confirmed hectic. Fistula lachrymalis is here also common; and I had an opportunity of seeing some cases of suppuration within the substance of the mastoid process, one of which proved fatal, from caries and effusion of matter in the dura mater. It was attended with symptoms of cerebral compression.

Scrofula in all its forms, such as tubercular phthisis, caries of the bones, &c. is not less frequent here than at Pisa. The Italians administer occasionally muriate of barytes in this affection, and Vacca often sends his scrofulous patients to the sea for the benefit of bathing.

The operation for cataract, employed both at Florence and Pisa, is depression or else reclination, the needle being introduced through the sclerotica.

2. *Ospedale de St. Bonaficio*, destined for the reception of lunatics, incurables, and those afflicted with cutaneous complaints, is capable of containing one thousand patients. The lunatics are here much better treated than at Pisa or Genoa: they are never chained, but are subjected to much milder modes of coercion, such as the strait waistcoat. Dark rooms, having the walls lined with padding to prevent the patients from injuring themselves, are used for the confinement of persons during the accession of the maniacal paroxysm. There is no care taken to provide amusements or employment for the patients, and, on the whole, their *moral treatment* is entirely neglected; so that Dr. O. justly remarks, it ought to be called an *asylum*, not an *hospital*, for lunatics, the latter name implying the application of proper curative means. The consequence of this neglect is, that a cure is scarcely ever heard of.

Foundling Hospital.—A well-managed institution, which receives annually from fifteen hundred to eighteen hundred infants. They are well taken care of, and remain one year in the house, after which they are sent to the country. The bedsteads are iron, and each contains four separate divisions, in which are placed our children's beds. This arrangement facilitates the attendance of the nurses upon the children.

"The diseases observed among the foundlings are not numerous. Inflammation or blenorrhœa of the eyes is uncommon, a circumstance probably owing to the exclusion of a glaring light from the wards, and to their cleanliness and proper ventilation. Jaundice, and induration of the cellular membrane, are quite unknown here. A great number of children are said to fall a sacrifice to syphilis. When brought into the house, they are apparently healthy, but in the course of a few weeks, or even days, they become pale and thin, cry or rather *whimper* much, get an appearance of old age in the face, and often become covered, about the genitals, anus, &c. with pustules and small ulcers; they grow

cachectic, and finally die in a state of marasmus. The exhibition of mercury in this affection is found to be quite useless. I myself concur in the opinion of Dr. Breschet, of Paris, who has observed a similar complaint among the infants in *l' Hospital des Enfans trouves*, but does not conceive it to depend upon syphilitic taint. His observations render it probable that it arises from an insidious inflammation of the abdominal viscera; a view of the subject confirmed by the diminution in its mortality, since a mode of practice founded on this view has been adopted.

A small *lying-in hospital*, containing six beds, erected for the instruction of the Tuscan midwifes, is connected with the Foundling Hospital. In order to obtain a license to practise midwifery, the females must attend three courses of lectures on that subject; besides which, they must reside eighteen months in the institution. The anatomy of the female pelvis is taught by means of beautiful wax models, which can be taken to pieces.

Puerperal fever is rare at Florence. On an average, twins occur five times in the hundred. The cæsarean operation has been performed twice there, and in both cases was unsuccessful. The midwifery practice seems on the whole judicious, and the accoucheurs are not addicted to the unnecessary use of instruments in delivery. Professor Bigeschi speaks highly of the ergot, as a means of forwarding the progress of labour in tedious cases.

"I must not omit mentioning the celebrated Florentine waxworks, which exceed the Vienna collection, not only in number, but in execution and anatomical accuracy. What has been added lately is inferior to the old collection, especially in the colouring. I shall never forget my astonishment at seeing a representation of the distribution of the fifth pair of nerves. It left nothing to be wished for, and had every branch described by a Bock or a Meckel. In fact, on examining it, you could not determine which was the more to be admired,—the anatomist who made the dissection, or the artist who made the model. The late Professor Ucelli, who was not only an able anatomist, but an expert artist, enriched this collection with many beautiful specimens in comparative anatomy, well worthy of a minute examination. The imitations of plants, fruits, &c. are not less elegantly executed; but this part of the collection loses its value, from the circumstances that the objects represented are indigenous in Italy; and we do not find any imitations of rare or tropical plants.

"I did not observe so great a number of blind people in any Italian city as in Florence. Every good begging station in this city is occupied by a blind beggar, and those stations descend by hereditary right, from one generation to another. How great the profits of these beggars must be, appears from the answer

of a young man, when asked how it happened that he could afford to marry:—"*Thank God I have a blind father; therefore, as long as he lives, I shall never want.*" In general, these blind beggars are attended by stout young men, so that the proper order of things is reversed; for he who can neither see nor work supports him who can do both!

"Here I cannot omit adverting to another custom, prevalent not only in Florence, but in the other Italian cities, and which must necessarily exercise an injurious influence on the state of the medical profession. The apothecary's shop is the physician's rendezvous; for his messages are left, not at his own house, but at the shop of the apothecary whom he patronises or who patronises him.

"The Italians do not understand the comfort of the expression "at home," like us Germans, but spend all their leisure hours in the open air, in the street, and engaged in the "*dolce far niente*." The first thing the Italian practitioner does in the morning, is to hurry to his apothecary's shop, for the purpose of learning what orders have been left for him. Meetings are held by physicians, and appointments made at the shop of the apothecary; and there the young physician, who is looking for practice, *must* loiter away his days: I say *must*, for, if he does not do so, he will not succeed. Every stranger, who is in want of a physician, sends for one to the apothecary; and every one who has no family physician, does the same. The *understanding* relative to their mutual interest, which arises from this singular connexion between these branches of the profession, must prove injurious to the patient, at least so far as it increases the probability of his being made to swallow medicine, more with the view of increasing the bill, than of restoring his health. This custom evidently degrades the physician, by making him a sort of creature of the apothecary, and likewise occasions a most serious loss of time, just at that period of life when his time is most valuable."

The Papal Dominion.—There are two medical schools in the dominions of the Pope,—viz. one at Bologna, and one at Rome.

Rome.—The university at Rome is named *Della Sapienza*, and has fourteen medical professorships. This university has no museum whatsoever.

The medical clinic is in the *Ospedale di St. Spirito*, where practical anatomy is also taught. The surgical clinic is in the hospital at *St. Giacomo in Angustia.* There is no institution for the instruction of accoucheurs. The internal arrangement of the Roman hospitals is so peculiar that it deserves particular notice. They are altogether ecclesiastical institutions, formed according to the notions of churchmen, and destined to serve rather as asylums for the administration of spiritual consolation

than for the cure of diseases. Accordingly, the physicians and surgeons are persons but of secondary importance in a Roman hospital, while the priests and confessors enjoy the chief authority! They alone are the resident officers; to them the admission of a new patient is first communicated; and they administer the first remedies, confession and the sacrament. Chance must decide upon the remaining part of the cure; for, after having taken care of the soul, they concern not themselves about the cure of the body! The hospitals are small, but on the whole rather clean. The bedsteads are generally made of iron, some with and some without curtains. Some of these hospitals are situated in the most unhealthy parts of the city. They are nine in number, and altogether contain about two thousand beds. In some there are separate wards for consumptive patients; for the opinion that consumption is contagious, is universal in Italy. In the lunatic asylum are four hundred patients, on whom the whip and the chain are not spared! Some of the hospitals cannot be visited by strangers, except permission has been granted by the Pope, a favour of which his holiness seems to be very sparing. All the convalescents from the different hospitals are brought to that of the *Holy Trinity*, for the purpose of enjoying the benefit of a nutritious diet. Dr. Oppenheim finds fault with this arrangement; and we agree with him in thinking that the convalescents might be well fed in the different hospitals, without going to the trouble of removing them to this general convalescent hospital, where, after all, they are only permitted to remain three days!

The diseases of every nation are necessarily much influenced by the customs and domestic habits of the people, and the nature of the climate. He who has not been an eye-witness of it, cannot form any idea of the uncleanliness prevalent in the south of Italy. The stranger, on his first arrival at Rome, is amazed at seeing whole groups of people, "*gruppi dei otiosi*," consisting of fathers, mothers, children, and friends of the family, all employed in performing for each other an office which we shall not name. Suffice it to say, they use their fingers for purposes elsewhere performed with combs! this custom is so general, that it has, as a matter of course, occupied the pencil of the artist; and, in the magnificent collection of pictures at Florence, is one in which Venus is seen thus elegantly employed on the head of Cupid! So much are the inhabitants accustomed to sleep two in one bed, that, when two strangers arrive at a country inn, and require two beds, their demand is considered unreasonable. The peasants of Rome and Naples look upon washing and cleansing the skin as quite unnecessary; and the upper ranks are not less negligent of the bath, than the ancient Romans were attached to its use. The great number of church holidays serves, indeed, in a certain degree, to keep the city from utter filth; for the

streets through which the religious processions are to pass must be previously swept.

In so warm a climate, this utter neglect of cleanliness necessarily produces an abundance of cutaneous complaints; and accordingly the hospital *Della St. Maria*, containing four hundred beds, is insufficient for the accommodation of patients so afflicted. Tinea capitis is treated in this hospital in the following singular manner:—The head is first smeared with butter, for the purpose of softening the scabs. When the scabs are removed, the head is shaved, and all the roots of the hair pulled out with a broad tweezers. The next step is to make forty or fifty incisions in the scalp with a razor. The free flow of blood from these incisions is favoured by making the child sneeze. The head is finally washed with cold water, and then rubbed with rancid oil. This *cutting* and *plucking* is repeated every four or five days, as fast as the hair begins to appear. This *cure*, which they commend for being *simple* and *radical*, lasts generally for six or eight months, and in obstinate cases for one or two years!

Vaccination is again much neglected under the present Pope, and of course small-pox is on the increase. There were about seventy small-pox patients in the hospital at the time of Dr. Oppenheim's visit.

We shall not enter into the sources of the "*aria cattiva*," which renders Rome so unhealthy, but merely remark, for the benefit of such of our readers as may intend to visit that city, that its influence is most severely felt during the months of June, July, August and September. The miasma produces, besides common agues, a very fatal species of fever, which is termed the malignant ague. The patient becomes at once weary and weak, complaining of heaviness of his limbs, heat of skin, dull headach, and confusion of ideas, &c. The looks are wild, the face oftener pale than red; and, even when it is flushed, a yellowish white tinge is perceptible near the angles of the mouth. The belly is often tender to the touch, and the right hypochondrium swollen. The patient is sometimes costive, but not unfrequently diarrhœa is present from the beginning. Enough has been related to place it beyond doubt that this fever, at its commencement, is of a gastric character, and is attended with an inflammatory affection of the liver. After the above symptoms have continued for some time, the fit commences with a violent rigor, which is followed, in an inconceivably short space of time, with a general and excessive disturbance of the whole nervous system; picking the bed-clothes, subsultus tendinum, the most violent delirium, and a low muttering sort of raving, succeed each other rapidly, and without any apparent regularity. In short, the disease at one moment wears the aspect of a fever attended with excitement, and at the next has all the characters of typhus

in its latter stages; and these two forms, alternating with each other, seem, if it were possible, combined in the same patient. After the fit, the patient feels a greater degree of depression than before. Vomiting often comes on at the height, or towards the end, of the paroxysm. The second fit commences five or six hours after the first; and the third begins after an intermission of about the same duration, unless, indeed, (which not unfrequently happens,) death has already closed the scene. *The third fit is always fatal!* Peruvian bark, exhibited in the largest possible doses, is the "*sacra ancora*" on which the Roman physicians place all their hopes. During the fit, blisters and sinapisms are applied to the extremities, while the head is assiduously cooled by means of cloths dipped in cold water. The instant the first fit has ceased, bark is given, and that with the greatest possible diligence, as they do not know the moment a second fit may commence. It is always a favourable symptom that the "patient bears the bark well, but it too often happens that the stomach immediately rejects it. When this is not the case, four, or even six, ounces of bark are exhibited in the course of the day. The second fit is then so much diminished in violence, that its accession causes but little disturbance, and the patient is saved. The progress of this disease is most rapid in strong, robust, and plethoric habits. Relapses also frequently occur. In1825, the proportion of recoveries to deaths was as eighty-five to fifteen; in other years, it has been as eighty to twenty. All other remedies have proved ineffectual in this fatal disorder. Venesection, emetics, opium, &c. seemed only to hasten its fatal termination, so that the physicians now place no dependance upon any thing except bark, which is used in immense quantities at Rome. The quantity used in the *Ospedale St. Spirito* often amounts daily to forty or fifty pounds."

The latter statement of our author, we cannot help observing, accords ill with his previous sweeping censure, concerning the inattention prevalent in the Roman hospitals with regard to the *bodily complaints of the patients.*

Some successful trials had been made at Rome with the sulphate of quinine, both in this fatal and in the common forms of ague. When there are symptoms of a deranged state of the alimentary canal, the Romans place no reliance on emetics, but cleanse the primæ viæ with one drop of croton oil, previously to exhibiting the bark.

The following rules are laid down by the Roman physicians, for strangers who remain at Rome during the sickly season:—They must get up at six o'clock, and, having made a light breakfast, on biscuits, coffee, &c. they may go about their business until after eleven. At one o'clock they dine, and ought to sleep for a few hours after dinner. It is reckoned dangerous to be

out at noon, sunrise, or sunset. Two hours after sunset, a walk is recommended; after which a slight supper may be taken. At twelve they ought to go to bed, and should sleep with but little bed-clothes. The windows of the bed-room should be kept shut during the night. Strangers are likewise recommended to indulge in cool drinks, and to be very abstemious with regard to wine, which ought to be diluted with water.

"Phthisis is not common at Rome, and its introduction has been attributed to the English! for it is universally believed to be contagious. When a consumptive patient dies, his clothes, furniture, and bed, are always burned. There exists, too, a Papal Bull, prohibiting the sale of such articles. Srofula is not uncommon at Rome, and calculous complaints are of rather frequent occurrence. Professor Sisco, who has performed the operation of lithotomy on more than fifty patients, follows the method recommended by Cheselden,—i. e. the lateral operation: his success has been considerable, and he objects in strong language to the recto-vesical operation of Vacca. The Roman surgeons boast of great success in strangulated hernia. Sisco never tries to heal the wound by the first intention, because he considers the cure by suppuration as the only radical one, as it produces a complete solidification of the parts, and thus prevents the necessity of afterwards wearing a truss.

Aneurisms are not common in Rome; their cure is generally attempted according to Vansalva's method. The Roman surgeons *have hitherto never ventured to tie the artery in this disease, but always proceed at once to amputation when Vansalva's method fails!* and yet Rome is scarcely three days' journey from the residence of Scarpa!

In syphilis, mercury is now used both externally and internally. Buboes are never permitted to burst spontaneously; they are always opened with the lancet.

The doctrine of contra-stimulus has fewer advocates in Rome than in any other Italian city.

Bologna has sixty thousand inhabitants; an university, two civil hospitals, an orphan-house, and a work-house. *Spedala della Vita* contains about five hundred beds; the wards are spacious, well ventilated and clean. Professors Comelli and Tommasini superintend the medical clinic, and Professor Venturoli the surgical. It is unnecessary for me to detail the medical practice in vogue here, as it is generally known, and the doctrines of contra-stimulus are already sufficiently familiar to the medical world, through the medium of a journal published in Bologna, under the title "Giornali della nuova Dottrina Medica Italiana." Without discussing the merits or demerits of this doctrine, I may, however, remark, that the very large doses of medicines which its advocates are in the habit of exhibiting, have

universally the effect of rendering the system so difficult to be acted on, that the doses must be constantly increased, in order to produce any effects. Thus, I saw a man under treatment for abdominal disease, on whose bowels half-a-drachm of jalap, and four ounces of castor-oil, had not the least effect, until their action was assisted by a purgative enema! We pass by the other hospitals, as affording nothing worthy of remark, except that their internal economy seems better regulated than that of other Italian hospitals.

The university reckons about six hundred students. It is large and beautifully built, and contains not only a good museum of natural history, but a tolerable anatomical collection. The preparations with which it has been enriched by the present professor of anatomy, Mandini, are very fine; as are also those made by Professor Quadri, who formerly taught here, but now resides at Naples. In the wax-works I was much struck by the beauty of the pieces representing the muscles: they are the works of Lelli and Madame Penarolini. The library contains about 150,000 volumes. The librarian, Professor Mezzofanti, is distinguished in the literary world by his uncommon talent for languages. The Botanical Garden is the best I saw in Italy.

The Kingdom of Naples.—A glance at the state of general literature in Naples, will best explain the state of medical science in that city. All foreign books, even those which have received the sanction of the Roman censors, are subjected to the revision of the Neapolitan censors. If, after a scrupulous examination, nothing is detected unfavourable to the king or church, the publication of the book is permitted, and a tax of four carolines on each volume must be paid by the publisher; this sum is exorbitant, when we consider the cheapness of Italian books. So heavy a tax is likewise imposed upon public prints, that it amounts to a prohibition of all foreign journals. These regulations render the advancement of science so slow in Naples, that what has long since become obsolete in other countries is there considered as a literary novelty. The Neapolitan physicians find it, therefore, impossible to keep up with the modern improvements in medicine, and consequently their practice is formed on antiquated models. Luckily for the inhabitants, the climate is so mild, that they seldom stand in need of medical aid, and may in general leave their complaints to the cure of the *vis medicatrix naturæ*. Little can be expected from an university in such a country, even though it boasts of such men as Vulpes, Quadri, and Lanza. The hospital accommodation, too, at Naples, is quite disproportioned to the number of the inhabitants, which amounts to 450,000.

Dr. Oppenheim then proceeds at some length to describe the *Lunatic Asylum* at Aversa, a small town, situated eight miles

from Naples, on the road to Capua. This institution excels, indeed, all others in Italy, but still falls far short of similar institutions in England and Germany. The only peculiarity we think worth relating, arises from the habits and genius of the Neapolitan people. In English mad-houses, much reliance is placed in affording means of employing or amusing the convalescents. With this view, we provide the lower classes with the means of following their ordinary trades and occupations, while we offer to the rich the recreation of cultivating a garden, or reading in a library. At Aversa, what are the objects of amusement? Billiard tables, music, various petty national games, puppet-shows of all descriptions, and a variety of toys!

We would almost believe its inmates to be boys, not men: but men it seems they are, at least in Naples, where even the upper classes spend the whole day in the coffee-houses or at the theatre, while the lower orders visit the puppet-show at seven o'clock in the morning, after which they dance the "tarantala," and play the "morra." This systematic trifling and habitual idleness afford a sufficient excuse for the indignation of the priest described in Kelly's Memoirs, who having dispersed a crowd of Lazaroni assembled around a puppet-show, held up the crucifix with which he had dealt his blows, and cried "*Ecco il vero Polcinello;*" an exclamation which at first appears ridiculous, if not impious, but really conveys a most degrading idea of the people whom he addressed.

The Lombard State forms at present a province of Austria, and the constitution of the two universities it possesses is modelled entirely according to the plan of that of Vienna. A certain course of study, which lasts for five years, is laid down, and no deviation from this plan is permitted. The disadvantages of a restrictive plan of study, which assimilates an university to a great school, are too obvious to require comment; and we cannot therefore help regretting, with Dr. O., that it should have been lately introduced into France. Our regret is increased by observing that this plan does not include a branch of medical study, to which we owe our chief progress in anatomy and physiology, and to whose aid we are to look for important additions to pathology,—we mean comparative anatomy. When (says Dr. O.) we find so important an omission, we must indulge in gloomy anticipations concerning the future progress of science in a state which was formerly so distinguished in comparative anatomy, and produced such men as Spallanzani, Valsava, Lancisi, &c.

Padua, a town with twenty thousand inhabitants, has one spacious hospital capable of holding three hundred patients. The wards are clean and well ventilated, and the beds are placed at a sufficient distance from each other. The clinical wards con-

tain twenty-four beds. The medical department is superintended by Professor Brera; the surgical by Professor Ruggieri. The university reckons about seven hundred students. The building is very beautiful, and originally a palace, planned by Palladio. The cabinet of natural history is tolerable. Fabricius ab Aquapendente, Prosper Alpinus, Morgagni, and other celebrated men, once ornamented this school. Brera, the present professor of the practice of physic, is a zealous advocate of the system of contra-stimulus, and of course propagates this doctrine among his pupils. It has, however, found fewer advocates among the private practitioners at Padua, than among those at Bologna.

Pavia has twenty-two thousand inhabitants. The town hospital is well situated and very roomy, and contains four hundred beds. It is better calculated for the purposes of an hospital than any other institution in Italy, having been originally built for the accommodation of the sick, and not, like the rest, for a monastery or a palace. There are four clinical wards, viz. one for medicine, one for surgery, one for diseases of the eye, and one (as the catalogue has it) "*per la istruzione di maestri in chirurgia e flebotomia.*" Connected with the hospital is a small institution for lying-in women.

The university is attended by about four hundred students. The building is large, and the architecture fine. No university in Italy can boast of such rich cabinets of natural philosophy, chemistry, natural history, and anatomy. The latter, commenced by Rezia, received many valuable additions from the celebrated Scarpa, lately a professor at Pavia. Burserius, Tissot, and the two Franks, formerly taught at Pavia.

ANATOMY.

Dr. Barclay on the Eyes.—The author (whose opinions on anatomical and physiological subjects are of great value) has published an interesting paper in the Edinburgh Journal of Medical Science, from which the following is an extract:—

"The orbits, in man, are situate in the forehead, on each side of the nose, and at a distance so small, that both eyes may sometimes be directed to the same object, if placed before them in a space intermediate, and not too near. As the forms of the head, however, the forms of the neck, trunk, and extremities, are different in different genera of animals, with motions at the same time suited to their instincts, habits, and circumstances, we should not be surprised to see organs of vision varying in form, position, magnitude, and number, to accomplish all the variety of purposes for which they are intended.

"If two eyes, therefore, with varieties of motion and other advantages, be perfectly sufficient for the human individual in ordinary situations, even several thousands may not be more than necessary in those animals where the eyes are fixed, and where the position cannot so readily admit of a change. To illustrate my meaning still farther, let us take the human eye as the standard, and compare it with the eyes of quadrupeds, birds, insects, and some other animals, and try to ascertain in what cases, and for what purposes, they differ in form, position and number, and also in relation to structure and capacity for motion.

"In the first place, the human eye is almost completely surrounded with the bones that compose the orbit, excepting near the pupil, where the light is admitted. Within the orbit are seven muscles; one for the motions of the upper eyelid, to open it when required; and one externally spread over the eyelids, to shut them instinctively when we fall asleep. Six muscles, inserted in the eyeball, are entirely within the orbit; four of these have their origin in the bottom of the orbit; around the sides of the foramen opticum, and are called straight muscles; the remaining two are termed oblique, distinguished by the epithets superior and inferior. The superior oblique rises, with the four preceding, at the side of the foramen opticum, and running forward, passes through a pulley, then across the eyeball, towards the temporal side of the eyeball, to be inserted into the sclerotic coat, not far from the cornea. The inferior oblique commences at the forepart of the orbit, runs at first towards the temporal side also, and, bending a little to the nasal side, is inserted opposite to the superior oblique, to roll the eye in an opposite direction. Four of the six muscles arising from the sides of the foramen opticum, and proceeding more directly to the place of their insertion, are termed straight muscles, in contradistinction to the oblique: one of them, inserted in the upper part, is called the levator of the eye; its antagonist, on the opposite side, is named the depressor; the one inserted on the nasal side is the adductor, and the one on the temporal side the abductor. These four muscles, considering the place of their origin, would naturally draw the eyes backwards, into the bottom of the orbit, were they not opposed by the soft substance in which they are imbedded, and by the action of the two oblique, which have a tendency to draw them in an opposite direction. At any rate, the change of place, or the locomotion of the whole eye, is not very perceptible. We can distinctly observe the pupil moving upwards and downwards, between the levator and the depressor, as it were, upon an axis, extending from the nasal to the temporal side of the orbit; and we see it moving from right to left, as it were, upon an axis; extending from above downwards, and also rolling between right and left, as it were, upon an axis, ex-

tending from the bottom of the orbit towards the cornea. From this we are led to suppose, that these three axis pass through the eye near its central part, and that any change of position in the whole body of the eye is thus rendered unnecessary.

"Observing that the pupil can point upwards and downwards, to the right and the left, without any motion of the orbit, or, while the orbit is in motion, point as steadily to the object which it is examining, as the needle to the pole—it follows, that the eye moves not only in the orbit, but that the orbit also moves round the eye; as we may observe when looking steadily at a lighted candle, and moving the head upward and downward, to the right and to the left, and yet the pupil all the while pointing steadily to its object. These motions, however, have certain limitations; when we wish to increase the sphere of vision, we employ occasionally the muscles of the neck in moving the head upwards and downwards, or turning the face to the right and the left, by its rotatory muscles.

"When the muscles of the eyes, of the head, and of the neck, are found insufficient to direct the pupil to every part in the whole circumference of the horizon, we can turn round on the heads of the femora, and see every point, behind and before, without changing the spot upon which we stand, and instinctively dilate or contract the pupils to regulate the quantity of the rays of light that may be deemed necessary for distinct vision.

SURGERY.

4. *Richter on Bronchotomy.*—There are two classes of writers, between which the attention of practical men may be profitably divided.

The first consists of such as have diligently observed and faithfully reported the facts they have met with. Good sense, industry, and fidelity, are the only qualifications required in such writers, and as long as the profession is cultivated with success such will abound; since, on the one hand, the materials for the improvement of medical science can be found only in the accumulation of facts confirmed by multiplied and varied observation; and since, on the other, every improvement *thus* made, begets (as *real* improvement always does) an increase of esteem for observation and experiment, and an increase of talent and industry in their prosecution.

The second class of writers to which we allude must be always more limited in number, though of a higher character. It includes only men endowed with pre-eminent talents, who have enjoyed the best advantages of education, who have had superior

opportunities of practice, and who have reaped the fruit of these during a lengthened experience. Such men are the lights of the profession, serving to guide us through the intricacies which false instruction, and the natural obscurity of the subjects of medical research, have combined to multiply around us.

It is the office of men qualified as we have described, to arrange the facts which minor contributors have furnished; to compare them with the results of their own more enlarged and discriminate observation; and thus to establish their import and relative value, winnowing false from true, with that tact and discrimination which is the result neither of talent nor experience singly, but of both combined. It is for such masters in the art to view with a comprehensive mind the lines of evidence, as they run apparently counter to each other; and to deduce from them those fundamental practical truths, which accord at once with just physiological reasoning and the results of multiplied experiment.

As men who answer the character we have endeavoured to describe, we number, in our own country, Abernethy, Cooper, Hey; and Richter, in Germany, certainly ranks in the same class; and he has given us (as it is highly desirable every such man should) a systematic view of the rules which guided him to success and usefulness throughout a long and extensive practice. His principles of surgery, perhaps, on the whole, the best and most complete systematic work extant, on the subject, in any language, has been thought worth translating into French—though it must be allowed that language is by no means deficient in original surgical literature. But whether from the prejudice, the narrow and illiberal prejudice, which certainly did, (we will not say does yet) prevail against foreign surgeons, or from some other causes, few indeed of their writings, especially few of the Germans, have appeared in English; and Richter still remains inaccessible to the generality of the profession. It is not the least merit of foreign medical literature, that it abounds in works methodically and systematically arranged—an excellence which writers in this country are too much disposed to undervalue.

It is true that attempts at systematic arrangement have often given occasion to writers, of little sense, for the display of useless distinction and mock acuteness; and the most ridiculous specimens of this kind of pedantry are not uncommon:—but this is the abuse of methodical order; its advantages when used judiciously are obvious and important: it ensures *completeness and facility in reference*, both most necessary qualifications of works intended either for elementary instruction or consultation on emergencies.

We have read books and heard courses of lectures, which, though excellent, in general were partial, and inadequate to the

fulfilment of their purpose, merely because—for want of method—they passed by *some things*, which, though comparatively small, are yet absolutely necessary to be learned: or, because for the same want of arrangement, what they did teach could not be found with readiness on the emergency which required its use. We submit it to the consideration of authors and lecturers, whether a greater attention to arrangement than is common with us in England, would not greatly enhance the value and utility of their labours.

The plan of Richter's work, which has rendered it so complete and so well adapted for reference, is a recommendation of its merits which ought not to be overlooked; and the execution of the whole is such as to vindicate his claim to the honourable epithet of 'the judicious,' so generally bestowed upon him. We offer these reasons for presenting our readers with an abstract of the most interesting parts of his work, and a comparison of his surgical opinions with those of the most eminent surgeons of our own country.

We begin with the diseases of the head and neck; and of the surgical subjects which fall under this head, we select that which is inferior to none perhaps in importance, viz. *Bronchotomy*. The chapter which has this title in Richter's work includes not only the operation itself, but the general history and treatment of the cases which require it. The operation of bronchotomy is but rarely performed, although the cases which require it are so frequently occurring; whence does this arise? generally from the mere ignorance or unpreparedness of the surgeon, who cannot perform it; or if the case be under the care of a physician, to his folly, who will not have it performed; for, to the reproach of multitudes of physicians, or rather, perhaps, to the reproach of the education they receive, be it said that they are perpetually undervaluing or traducing the resources of surgery, because they know nothing of them.

The rare performance of this operation cannot be justly ascribed to its difficulty or danger, for it will be presently shown that in the hands of a moderately instructed surgeon, it is both easy and safe in general; and were it indeed considerably dangerous, this would not be a reason for declining it in the majority of cases in which it is recommended, since, in these, death without it is little less than certain. The operation is to the instructed surgeon easy—it is safe—it is life-giving; why then is it not done so often as it should be?—The explanation is, that this operation, like that for hernia, the securing large arteries, and a few others, requires *prompt* performance, affords little time for consideration or consultation, and none for the renewal of anatomical knowledge. The surgeon is called on, to act, generally by himself and for himself, and unless he has that decision

of character and confidence, which, if he is not *entirely* ignorant, and therefore rash, he cannot obtain but by being *entirely* master of the business he is called to. Unless he has *confidence, founded on knowledge*, he will neither dare to attempt nor be able to perform his duty. We have known surgeons in the country defer the operation for hernia until it was useless; and then, if they were not allowed altogether to omit it, the event of a bungling endeavour to perform it could be excused on the ground of the patient's state at the time of operation.

If they were to operate at all, they were careful first to let the patient sink into that state which should save them the shame of *appearing* to kill him, however really and effectually they might do so; and all this not from cruelty, not from inhumanity, but because they were reluctant to engage in an undertaking for which they had not previously prepared themselves. Thus it is often with the operation of bronchotomy; and it claims the attention of the surgeon, not only on the ground of its general importance, but especially on this ground, that the life of a fellow-creature may depend on his readiness to perform the operation at a time when he least expects to be called to it, and when he cannot add any thing to the qualifications with which he may have prepared himself in the course of his general education. The objects in view in the operation are:

1st. The formation of an artificial passage for air, when the natural passages through the mouth and nose, or larynx, are obstructed; and

2d. The removal of foreign bodies from the air passages. Richter's experience had taught him that, under every variety of circumstance, the operation was calculated to fulfil these indications; and to its facility and safety he bears most decided testimony. The operation is employed with the view of affording an artificial passage for air chiefly in the following cases:—

1st. In *Cynanche Laryngea* (or as Richter has it, Angina Inflammatoir á Laryngea,) and more rarely in *Cynanche Tonsillaris* the first of these diseases has attracted much attention in this country, within the last few years*, and the efficacy which Richter ascribes to the operation in this case is confirmed by the experience of English surgeons. It is an important remark of Richter's, that in this disease the operation must not be employed merely as a last resource, "because," he observes, "that every inflammatory affection (whatever be its original seat,) which is accompanied by long continued difficulty of breathing, is very

* See papers by Dr. Baillie and Dr. Farre, in 3d vol. of Med. Chir. Trans. —by Dr. Roberts, and Sir G. Blane, and Mr. Lawrence on affections of the Larynx, in 6th vol. of the same; and for the diagnosis, see particularly the appendix to Dr. Farre's paper.

easily succeeded by inflammation of the lungs, and this often proves fatal, though the symptoms of the original disease may have been relieved."

This tendency to inflammation of the lungs in such cases, is not, perhaps, well understood; we can scarcely attribute it to the mere laborious exercise of their functions, caused by the straitening of the glottis, for many asthmatic patients endure long the most distressing dyspnœa without any inflammatory affection of the lungs; and it is only when dyspnœa depends on *inflammatory* disease that it produces pneumonia. This difference between the consequences of difficult respiration in spasmodic and inflammatory diseases, might be attributed to the *disposing* influence of the febrile state accompanying the latter, but we are not aware that this view admits of proof.

We may often illustrate, and in some degree establish, the import of facts which we cannot fully explain, by comparing and classing them with others of similar character, and by referring to that more general fact on which they seem all to depend.

And if we set aside that explanation to which we have alluded, as attributing inflammation of the lungs following that of the larynx, to laborious respiration under the disposing influence of febrile excitement, then the case will remain quite analogous with that of acute hydrocephalus succeeding inflammation in the abdomen, or that of cynanche tonsillaris, alternating with pneumonia. Of both these cases we have seen instances; and facts of a similar character are numerous. The whole, we apprehend, may be referred to the general fact which the observations of Dr. Wilson Philip seem to have established, viz., that sympathetic irritation, whether connected with similarity of function between the parts concerned or not, is a frequent cause of inflammation.

One of the most remarkable instances of this kind, to which he alludes, is inflammation following the sympathetic pain connected with hepatitis. And we should be disposed to regard the connexion between inflammations of the lungs and that of the larynx, when the one succeeds the other, as precisely of the same nature; without, however, denying the probability, that the disturbed respiration and the febrile excitement, may together have some influence.

We should not have allowed ourselves this digression from the subject immediately under consideration, were it not for the purpose of adverting to an important pathological truth, and of giving an instance in confirmation of it. The consideration that mere sympathetic irritation may, if long continued and violent, induce inflammation, deserves to be borne in mind by the practitioner, both in his diagnosis and treatment.

In the treatment then of cynanche laryngea, it is necessary to

remember the fact, (explain it as we may) that this disease may be succeeded at a very early period by inflammation of the lungs. To this argument for the early performance of bronchotomy, may be added, that we have less reason to expect success from the general treatment of inflammation in this case than in most others. Mr. Lawrence mentions, as the result of his observations, "that local and general bleeding, blisters, and the various internal means are usually inefficacious."—See the excellent paper already referred to, Vol. V. of Med. Chir. Trans., p. 248. That the operation, when employed early, saves the patient many hours of the severest suffering, while, as Richter remarks, the local effusion of blood accompanying it is best calculated for resolving the inflammation itself. Richter accordingly asserts, "that he has seen the bleeding during the operation afford immediate relief, and that in one hour after, the patient has already been enabled to breathe by the mouth."

The narrowing or complete closure of the glottis, to which the symptoms of impending suffocation are immediately owing, Richter supposes to depend, not so much in general on its thickening or swelling, as on its spasmodic constriction, produced, as he says, by the irritation which accompanies the inflammatory state.

This connexion, we may observe, of inflammation and spasm, is remarkable in most cases of inflammation, affecting organs, whose structure and constitution, like those of the larynx, admit the combination; it is particularly the case with organs in which secreting membranes, highly vascular and sensible, are combined with a muscular structure; thus we have frequent instances of inflammation of the intestines, accompanied by spasmodic colic, and of inflammation of the bladder, accompanied by spasm of its neck, and consequent retention of urine. We may thus understand why opium is so frequently useful in inflammatory diseases. We are too much in the habit of considering the instances in which it is so, as mere exceptions to the general rule, which we need not seek to explain. With regard, however, to cynanche laryngea, Sir G. Blane, speaking of two favourable cases, says, "opiates were abstained from,"—and "that the disease being inflammatory, there is every reason for avoiding them till the complaint shall have been fully subdued by the antiplogistic treatment."—Vol. VI. Med. Chir. Researches, p. 149.

With this view of the proximate cause of the disease, Richter sets aside the objection made by Sharp to the utility of the operation: the objection rested on his observation, that the glottis was free and open after death, but the constriction being spasmodic, it is evident that this was no more than might be expected; and it is equally plain that it cannot affect the utility of the operation in any degree.

In connexion with this view of the immediate cause of death in cases of cynanche laryngea, we may mention a conjecture relative to the nature and treatment of croup, which, if well founded, may be of some practical importance. Richter says nothing of the utility of bronchotomy in the latter disease, probably he did not think it necessary to mention it separately or distinguished from cynanche laryngea, considering the arguments stated in favour of the operation in one as applicable in every respect to the other.

It must be allowed, we think, that foreign bodies in the trachea usually kill by exciting spasmodic constriction of the glottis; perhaps we may go yet further, and conclude, with Mr. G. Bell,* that they always kill in this way; those cases indeed excepted, in which death ensues only at a period long subsequent to the accident, and is owing to inflammation and its consequences.

The two following considerations seem almost conclusive in favour of this opinion: 1st, No foreign body, nearly large enough totally to obstruct the trachea, can pass through the glottis. 2d, The chief symptoms of a foreign body in the trachea occur in paroxysms, and it is during a fit of convulsive coughing and laborious breathing, that the patient usually dies.

It is true that this latter fact may be explained, when the foreign body is loose and moveable, from its being at intervals forced upwards into the glottis, which it not only thus increasingly irritates, but may be large enough nearly to fill; but are not the symptoms such also, when the substance sticks in the lower part of the trachea or in the bronchiæ? and if so, must we not conclude that foreign bodies in the air passages prove fatal, rather as causes of irritation than of obstruction; rather by exciting the muscles to contract than by interrupting the ingress and regress of the air? As to the propriety of bronchotomy in croup, the opinion of Mr. Chevalier (who seems to have paid considerable attention to the subject,) exactly accords with our own. He says, "I doubt whether death is often to be ascribed to such an accumulation of lymph as absolutely precludes the transmission of air."

If we consult the dissections recorded by authors, especially those by Cheyne and Jarine, we find that the following appearances have been observed. An effusion of lymph lining the larynx and upper part of the trachea, sometimes extending as far as its division, and rarely into the more minute bronchial tubes; the consistence of this lining is various, sometimes it has not sufficient tenacity to admit of its being separated by the forceps or

* Operative Surgery, Vol. ii. p. 13.

finger from the membrane to which it adheres; sometimes it is so firm that it may be drawn out entire from the trachea, and when it is extended into the bronchial tubes, it exhibits and long retains an aborescent form. Besides this effusion of lymph in the inner surface of the lining membrane, there is often considerable swelling around it, from the effusion of lymph on its external surface.

From the combination of these changes of structure, a considerable lessening of the diameter of the trachea must result; yet it does not appear that this is ever sufficient entirely to obstruct the passage, or even to reduce it to such a degree of narrowness as seems to have occurred in chronic cases, some time previous to death. We may remark, that the false membrane being sometimes so loose and moveable as to admit of its expectoration, a part of it may be carried upwards and downwards with every expiration and inspiration, the rest remaining fixed; it may thus act as a valve during expiration, and cause at intervals its entire and sudden obstruction. In general, however, after death, no part of the membrane is found so disposed as to be capable of acting as a valve, the whole of it adhering equally and firmly to the mucous membrane.

The bronchiæ and air cells, frequently also the trachea itself, are found loaded with mucus; and this is often in such quantity that some authors think it the usual cause of death; and certainly, if such an opinion were well founded, nothing could be expected from the performance of bronchotomy; but we have good reason to believe that this accumulation of mucus is merely a consequence of the original affection, which might be defined, inflammation of the lining membrane of the trachea, of the kind called adhesive, i. e. terminating in the effusion of coagulable lymph. This termination is a distinguishing feature of the disease, the effusion of mucus is not an immediate consequence of the inflammation; makes no part of the disease in question, but is merely a sequela of it, common to this and numerous other disorders of the respiratory system. We are warranted then in concluding from the dissections on record, that in general the effusion of lymph, the characteristic and exclusive produce of the inflammation in this disease, does but partially obstruct the air passages, although the accumulation of mucus, which ultimately occurs, perhaps in every case, may do so more completely.

The *symptoms* of croup are those which arise from a spasmodic affection of the glottis, combined with a certain degree of obstruction in the trachea and bronchiæ; and the characters which distinguish croup from severe catarrh or bronchitis, in young children, are owing entirely to the spasm of the glottis. The alternate remission and aggravation of the dyspnœa can

depend on this cause alone, and the peculiar stridulous respiration is attributable as much to this as to the narrowing of the trachea, if not more so. The occurrence of the chief symptoms of croup in paroxysms is acknowledged by the best observers; but it has received, perhaps, much less attention than it deserves in the explanation of the nature of the disease, and in the direction of its treatment. So prominent a feature is this intermission in many cases of the disease, that in the most classical work on the subject (that of Jarine) a distinct species is treated of, under the name of *Intermittent Croup.*

Taking it as an acknowledged truth, obvious to every observer, that the most urgent symptoms of croup are subject to alternate remission and aggravation, and considering that the effusion of lymph, if regarded merely as the means of lessening the diameter of the trachea, neither in any degree accounts for this peculiarity in the symptoms, nor appears an adequate cause of their urgency, we are justified in concluding that the effusion has an additional and different influence. The best established physiological principles, the impartial history of the disease in question, the history of diseases strikingly analogous, particularly cynanche laryngea, and cases of foreign bodies in the trachea, the effect of remedies, all concur in the indication, that this additional influence of the effused lymph consists in an irritation of the glottis sufficient to produce its spasmodic contraction.*

The symptoms of this affection of the glottis frequently occur, however, so early in the disease, that the mere existence of inflammation, previous to the effusion of lymph,† must be sufficient to afford this degree of irritation. To the connexion between inflammation and spasm, and the frequent examples of it in organs of a certain structure, we have already alluded, when speaking of cynanche laryngea.

According to the view we have taken of the nature of this disease, bronchotomy may give relief in it, although we should be unable to open the trachea below the point to which the false membrane has extended. This opinion may appear at first view absurd—it is, perhaps, novel; but it is still reasonable, unless

---

* Dr. Albers, of Bremen, seems to admit this opinion. He says, "we cannot deny that the spasm of the glottis, and perhaps also of the bronchiæ may contribute to suffocation, as these passages are not always completely obstructed by coagulable lymph.—V Abhandling uber de croup-von Ludwig Jarine Miet euner Vorrede und Aumerkungen hercius gegeben von Dr. J. A. Albers, Leipzig.

† Mr. Lawrence mentions a case in which the patient had well marked symptoms of cynanche laryngea, though after death the membrane appeared quite healthy, and the passage not at all narrowed.

the above statements, on which it is founded, can be pronounced utterly incorrect. The truth, however, of the proposition has yet to be decided by experience; and we can only now inquire how far the result of cases in which the operation has been tried hitherto, influences the question of its efficacy.

The operation has undoubtedly succeeded in many instances, but the success has been differently explained. In general, it seems that the operator has figured to himself the trachea nearly or entirely closed by coagulable lymph at a certain point, and has attributed his success to his having made an opening *below* that point; but what proof have we that this was really the case? No reason can be adduced why we should attribute success to this cause, and not to the mere fact of an opening having been made below the glottis, considering that as the real point of obstruction; it is as probable, that in these successful cases the false membrane extended below the artificial opening, as that it did not.

Mr. Chevalier, impressed with the conviction that the effusion of lymph was not such as "absolutely to preclude the transmission of air," ascribes the success of the operation in his cases to "its emptying the trachea of mucus;" but there is no proof that it was really owing to this cause, except that mucus was expelled through the artificial opening. May we not still ascribe the success, and with even better reason, to the cause we have mentioned, considering still the contracted glottis as the chief impediment to the transmission of air.

It may be objected to the view we have taken that, according to it, the operation ought always to succeed, whilst there are but too many instances of its failure. We only maintain, however, that, contrary to the current opinion, the operation is calculated to give relief; that it *may* succeed even where we cannot make an opening *below* the limit of the false membrane; and we would argue also, that the failure generally ascribed to the impossibility of making the opening in this situation, is obviously and justly ascribable to other causes, chiefly to its being deferred, until, in consequence of long continued laborious breathing, and the imperfect influence of the air on the blood, these changes in the general system are induced, which (as Mr. Lawrence and Richter have so strongly insisted) are causes of death, even when the original obstruction may have been removed.

The accumulation of mucus, though no part of the original disease, yet occurs to such a degree in the latter period of it, that it becomes a principal source of danger, especially as at this period sufficient strength does not remain to admit of its expectoration. To these causes we would attribute the failure of the operation, when properly performed, rather than to the one commonly assigned—and if we are correct, we must conclude

that the operation has failed in general, only because it has been employed too late. From what has been stated we would draw the following conclusions:—

1. That the general nature of the disease affords reason to expect the best effects from bronchotomy.

2. That these effects may yet be expected, when we cannot open the trachea below the limit of the effused lymph.

3. That where success has been obtained, it is to be ascribed merely to the introduction of air below the glottis, the real seat of the obstruction.

4. That the frequent failure of the operation may, in general, be ascribed to its being performed at so late a period; when the exhaustion of vital power and the accumulation of mucus, which cannot be expelled, are sufficient causes of death, though the original obstruction should be entirely removed.

The above remarks are submitted to the profession with the hope that they *may be* verified; and we could suggest, as subjects of peculiar interest, the observation of the exact circumstances under which the operation succeeds or fails; and this with a view to determine the causes of failure and success, so essential to the right application of the operation, and certainly hitherto not well understood. It will not, we trust, be disputed, that we are fully justified in trying the operation at an *early* period as often as opportunity offers.

In such cases the difficulty of breathing is so urgent, as to require speedy relief. Cynanche tonsillaris is rarely accompanied with sufficient swelling to threaten suffocation, before suppuration has taken place; and when this has occurred the puncture of the abscess will generally afford sufficient relief; if, however, the abscess were neglected, and left to burst spontaneously, the event might be delayed long enough to obstruct considerably, or even entirely hinder respiration.

An abscess in the tonsil can scarcely be opened too early. Should we, even through mistake, puncture the tonsil prematurely it is useful as a scarification, and it will be perfectly safe if done as recommended by Mr. A. Burns,* i. e. "by carrying the instrument directly backward, as if to cut off a segment of the tumour. Should the puncture of the abscess be delayed too long, not only does the patient suffer, when the abscess is large, all the distress arising from obstructed respiration, but there is also, as Mr. Burns has pointed out, the greatest danger of the pus rushing with the air into the trachea, as soon as the sudden bursting of the abscess allows of a free and full inspiration. Mr. Burns gives a case in which this actually happened, and induced

* Surgical Anatomy of the Head and Neck, page 257.

immediate suffocation. He recommends, therefore, the opening of the tonsillary abscess by a trocar, and warns us that since the abscess sometimes points through the velum, we are not always to expect the usual appearance of the tonsil, and to wait for this before puncturing the abscess.

PATHOLOGY.

3. *Bones containing Metallic Mercury.*—These were found in two subjects, both young. In the first, the ribs, the ossa ilium, the upper and lower bones of the leg, exhibited this appearance on being struck; and at present, several years after, mercury can still be shaken from them in the same way. The metallic mercury flowed out upon the dissecting tables, macerating tubs, and other apparatus employed by professor Otto and his friend Dr. Guret, whilst in the act of cleaning the bones. A piece, taken from the middle of one of the bones, was analysed by professor Fischer, and demonstrated evidently the presence of mercury. In fine, Dr. Otto has published these two singular facts, as affording "the most undeniable evidence of what is so generally doubted, the power of the living system to reduce the oxides of mercury, and the actual appearance of the latter, so reduced, in the bones."—*Med. and Phys. Jour.*

Lem